The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 119, NO. 2 — MAY 9, 1942

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CHICAGO, ILLINOIS

TESTS OF CARBOHYDRATE METABOLISM IN INFANTS

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Although the dextrose tolerance test has been widely used both in pediatrics and in general medicine for the recognition of disturbances in carbohydrate metabolism, difficulties are often encountered in the interpretation of the results obtained. In part, these difficulties appear to arise from a lack of conformity to accepted technics and consequently also to inadequate standards for comparison. In addition, there has been a tendency to view certain characteristics of blood sugar curves as specific for individual diseases without giving adequate consideration to the complexity of the physiologic processes involved. The present study was, therefore, undertaken with a view toward a better standardization and interpretation of the tests used to evaluate the state of carbohydrate metabolism in small infants.

METHODS

In the present study, the various tests of carbohydrate function commonly used in clinical medicine have been applied to a group of selected normal infants. The tests involved observations on the rise and fall of the blood sugar after oral and intravenous dextrose, dextrose and insulin, epinephrine, levulose and galactose. The infants varied in age from 1½ to 24 months. All were patients who had been admitted to the hospital wards for non-nutritional problems such as repair of harelip, clubfoot, or acute infections from which they had since recovered. They were ready for discharge when the tests were begun but were kept in the hospital as normal subjects for the study. The patients had been receiving a regular hospital diet for at least two weeks prior to the performance of the test, and at least five days were allowed to elapse before a second test was made on the same subject. Capillary blood for the blood sugar determinations was obtained from finger pricks. The Hagedorn-Jensen [1] method of sugar estimation was employed.

In the oral tests the dextrose was dissolved in the volume of liquid usually taken at a feeding, which included 1 to 2 ounces (30 to 60 cc.) of orange juice. The carbohydrate content of this was calculated as part of the total dextrose. To study the effect of different doses of dextrose on the blood sugar response the patients were given 1, 1.75 and 3 Gm. of dextrose per kilogram of body weight after a standard fasting period of twelve hours. Samples of blood were taken at the usual intervals—fasting and thirty, sixty, one hundred and twenty and one hundred and eighty minutes after the ingestion of the sugar. In the intravenous tests, 50 per cent dextrose, which is available in sterile 20 cc. ampules, was used, and the patients were given 1 Gm. of dextrose per kilogram following a twelve hour fasting period. The injection was given slowly over a period of two to four minutes. Samples of blood were obtained just prior to the injection and at intervals of ten, thirty, sixty, ninety and one hundred and twenty minutes afterward.

The so-called insulin sensitivity test consisted in the administration of dextrose orally and insulin subcutaneously. The procedure of the present study was to perform first an oral dextrose tolerance test, using 3 Gm. of dextrose per kilogram of body weight. After an interval of not less than five days the test was repeated, with the patient receiving in addition ¼ unit of regular insulin per kilogram of body weight subcutaneously. The insulin was injected exactly ten minutes after the patient started to drink the dextrose solution. This procedure was employed because otherwise the hypodermic injection might have upset the infant and caused him to refuse the dextrose. Blood samples were collected at the usual periods—initial fasting, thirty, sixty, one hundred and twenty and one hundred and eighty minutes. The curves obtained with and without insulin were compared and the degree to which the alimentary hyperglycemia was suppressed by the insulin was taken as an indication of the degree of sensitivity to insulin.

The rise and fall in blood sugar level after the administration of epinephrine (epinephrine tolerance test) was also investigated. After the usual twelve hour fasting period, 0.03 cc. (½ minim) of a 0.1 per cent solution of epinephrine hydrochloride per kilogram of body weight was injected subcutaneously. Blood samples for the estimation of sugar were obtained at the same intervals as for the oral dextrose tolerance test.

For the levulose and galactose tolerance tests a similar procedure was followed. After a twelve hour period of starvation either 1 or 1.75 Gm. of the sugar per kilogram was given by mouth. The sugars were dissolved in water and given without added flavoring. It was found convenient to use hot water to obtain rapid solution of the galactose. Blood for sugar analysis was obtained at the usual intervals during a period of three hours. No attempt was made to distinguish dextrose from levulose or galactose in the blood. The data for blood sugar level, therefore, represent a sum of the two. Pfanstiehl 90 per cent levulose, which is practically free from other sugars, was used. The impurities for this grade are described as calcium, levulosate and moisture.

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1. Hagedorn, H. C., and Jensen, B. N.: Biochem. Ztschr. **135**: 46, 1923.

This form of levulose is much less expensive than the 100 per cent chemically pure grade and for practical purposes is satisfactory. For the galactose test d-galactose (anhydrous) prepared by the Eastman Kodak Company was used.

TABLE 1.—*Blood Sugar Curves of Normal Infants Following a High Fat Diet and a Regular Diet*

Case	Dextrose, Gm. per Kg. of Body Weight	Type of Diet *	Blood Sugar, Mg. per 100 Cc.				
			Fasting	Minutes After Dextrose			
				30	60	120	180
A	3	Regular	84	126	168	130	82
B	3	Regular	78	140	150	164	88
C	3	Regular	85	176	136	112	84
Average			84	147	151	135	85
A	3	High fat	70	139	220	184	153
B	3	High fat	69	129	240	191	160
C	3	High fat	73	146	200	178	148
Average			71	138	220	184	154

The formulas were prepared by adding either butter fat or cane sugar to a whole powdered milk base in the following proportions:

Fat Diet		Regular Diet	
Whole powdered milk	55.3 Gm.	Whole powdered milk	140 Gm.
Butter fat	75 Gm.	Cane sugar	80 Gm.
Water to make	1,000 Cc.	Water to make	1,000 Cc.

The whole powdered milk, which was prepared by Mead, Johnson & Co. of Evansville, Ind., contains protein 26.8 per cent, fat 28 per cent, lactose (by difference) 37.7 per cent, ash 6 per cent, and moisture 1.5 per cent. When thus prepared, the high fat formula contains fat 9 per cent, carbohydrate 2.1 per cent, protein 1.5 per cent, water and minerals 87.4 per cent. The regular formula contains fat 3.9 per cent, carbohydrate 13.3 per cent, protein 3.8 per cent, water and minerals 79 per cent.

EFFECT OF PRECEDING DIET AND OF FASTING PERIOD

It is well known that the nature of the diet preceding a dextrose tolerance test has a distinct influence on the results obtained. Among the various workers in the field Himsworth [2] and Sweeney [3] particularly have shown that an increased proportion of carbohydrate in the diet results in a low blood sugar curve, whereas an increased proportion of fat in the diet causes a high and prolonged curve suggestive of "starvation diabetes." The height and prolongation of the curve bear a rough quantitative relationship to the proportions of carbohydrate and fat ingested. Relatively little attention has been given to this phenomenon in the interpretation of clinical data.

The present study afforded an opportunity for confirming these results on 3 small infants under the carefully controlled conditions of a metabolism ward. The infants were first tested while receiving diets of usual proportions. Later the fat content of the diet was increased until 85 per cent of the total calories was obtained from fat. The results, which are presented in table 1, show a distinctly high and prolonged blood sugar curve following the high fat diet. This is in agreement with more extensive investigations reported by others and reemphasizes the necessity of attention to diet when dextrose tolerance studies are being made.

Starvation, which affects metabolism similarly to a high fat diet by stimulating the utilization of large quantities of fat from the depots, is of equal importance. The so-called starvation diabetes has been recognized since the observations of Lehmann [4] in 1874 and Hofmeister [5] in 1890. In animals du Vigneaud and Karr [6] have shown that the height and duration of the blood sugar curves were increased progressively by previous fasting up to as long as twenty days. In human beings, the effects of short periods of fasting on the dextrose tolerance test are not generally appreciated. Bridge [7] has demonstrated on adults that an additional four to eight hours of fasting beyond the usual overnight period results in a distinct change in the dextrose tolerance test. While comparable observations have not been made on infants heretofore, it is well known that they withstand starvation less well than adults. Attention to this factor is obviously needed.

In a small group of infants, the effects of different periods of preliminary starvation on the dextrose tolerance test were observed. So far as possible, the same infants were employed to make the comparison between six, twelve and twenty-four hours of fasting. A test dose of 3 Gm. of dextrose per kilogram was used in all, and the tests were not repeated in less than five days. As will be seen in table 2, the blood sugar curves obtained after a six hour fast were very similar in the 3 infants studied. The maximal rise in blood sugar was less and appeared earlier than after the twelve hour fast. When the preliminary fast was extended to twenty-four hours, the effects on the sugar curve were somewhat irregular. In 4 patients the return to normal was delayed, but the maximal level attained was not necessarily higher than after the twelve hour fast. In 1 infant the more prolonged fast resulted in a distinctly low blood sugar curve. In general, starvation appears to affect infants as it does adults by causing changes in the direction of so-called starvation diabetes. Other factors are probably operating to account for the exceptions.

It is also interesting to note in table 3 the effect of starvation on the fasting blood sugar level. Normal infants showed little variation after the standard twelve hour fast. However, when the fast was extended to twenty-four hours all 6 patients showed either low or definitely hypoglycemic levels. Possibly this tendency to hypoglycemia is related to the low blood sugar curves mentioned in connection with the more extended fast.

TABLE 2.—*Blood Sugar Curves of Normal Infants After Different Periods of Preliminary Starvation and After the Ingestion of Three Grams of Dextrose per Kilogram of Body Weight*

Case	Length of Fasting Period, Hours	Blood Sugar, Mg. per 100 Cc.				
		Fasting	Minutes After Dextrose			
			30	60	120	180
A	6	90	158	136	118	81
B	6	91	155	142	120	85
C	6	89	155	146	124	87
Average	6	90	156	141	121	84
A	12	86	148	182	115	98
B	12	87	155	187	107	103
E	12	88	141	174	120	99
Average	12	87	148	181	114	100
A	24	51	114	153	148	144
D	24	69	89	117	162	139
E	24	58	98	147	198	171
F	24	60	84	116	203	158
B	24	63	88	119	114	97
Average	24	60	95	130	165	142

ORAL DEXTROSE TOLERANCE TEST

As commonly used in adult medicine, the oral dextrose tolerance test consists in the administration of a standard amount of dextrose after an overnight fast and

2. Himsworth, H. P.: J. Physiol. **81:** 29-48, 1934; Clin. Sc. **2:** 67-94, 1935.
3. Sweeney, J. S.: Dietary Factors That Influence the Dextrose Tolerance Test, Arch. Int. Med. **40:** 818-830 (Dec.) 1927.
4. Lehmann, W. L.: Arch. f. exper. Path. u. Pharmakol. **2:** 463, 1874.
5. Hofmeister, Franz: Arch. f. exper. Path. u. Pharmakol. **26:** 355, 1890.
6. Du Vigneaud, V., and Karr, W. G.: J. Biol. Chem. **66:** 281, 1925.
7. Bridge, E. M.: Unpublished data.

the estimation of changes in blood sugar level during the succeeding three hours. Sometimes the dose of dextrose is based on body weight; at other times a fixed amount is given regardless of the weight. In the case of infants, the test dose most commonly used has been 1.75 Gm. per kilogram. It is generally assumed that the rise in blood sugar level will be comparable to that found in adults. That this is not strictly correct is evident from the observations to be reported and from the observations in the literature.[8] As a means of determining the most satisfactory quantity of dextrose to use, a group of normal infants was given 1, 1.75 and 3 Gm. of dextrose per kilogram following a twelve hour fast. So far as possible, the same infants were used for all three doses, the usual interval of five days being maintained between tests.

TABLE 3.—*Fasting Blood Sugar Values of Normal Infants* *

Number of Infants	Length of Preceding Fast. Hours	Blood Sugar Level, Mg. per 100 Cc.
5	6	80 ± 1
111	12	82 ± 3
6	24	58 ± 4

* In this and subsequent tables, the ± figures represent the average range of two thirds of the data.

TABLE 4.—*Average Blood Sugar Curves of Normal Infants Following the Oral Administration of Dextrose*

Number of Cases	Dextrose, Gm. per Kg. of Body Weight	Blood Sugar, Mg. per 100 Cc.					Rise Above Fasting Level, Mg./100 Cc.	
		Fasting Level	Minutes After Dextrose					
			30	60	120	180	Maximal	Minimal
15	3.0	83±2	142± 8	170± 5	127± 9	85±7	113	73
10	1.75	86±2	127± 7	129±10	100± 5	82±4	62	50
10	1.0	82±4	108±10	115± 5	95±10	78±4	49	23

It will be seen from the data in table 4 that the blood sugar response was influenced by the amount of dextrose ingested. In the majority of the tests the maximal rise with each dose was obtained within one-half to one hour, although occasionally not until two hours. In most tests the level of blood sugar had returned to the initial fasting value in three hours. There was no overlapping between the groups. A maximal rise in blood sugar to 160 to 180 mg. per hundred cubic centimeters and a return to a normal level within three hours can, therefore, be considered a normal response to a test of 3 Gm. of dextrose per kilogram for infants under the age of 2 years. Standard conditions of preceding diet and fasting period should, of course, be adhered to.

INTRAVENOUS DEXTROSE TOLERANCE TEST

In studying disturbances of carbohydrate metabolism it is frequently helpful to eliminate the factor of absorption by injecting the dextrose directly into the blood stream. The usefulness of such tests has been discussed recently by Crawford [9] by Ross [8] and by Tunbridge and Allibone.[10] To obtain standards from which to judge the results of such injections, 15 normal infants have been studied. After the regular twelve hour preliminary fast they were given 1 Gm. of dextrose per kilogram intravenously and samples of blood were taken ten, thirty, sixty, ninety and one hundred and twenty minutes later. No attempt was made to determine the maximal level of blood sugar reached, which should occur within one-half to one minute. As will be seen in table 5, the blood sugar remained high during the first half hour. In all patients the initial fasting value was reached within one and one-half hours after the injection and never in less than one hour. By the technic used, therefore, curves returning to the fasting level in less than one hour or later than one and one-half hours should be considered abnormal.

THE INSULIN SENSITIVITY TEST

The activity of insulin in promoting the withdrawal of dextrose from the blood stream has received relatively little attention in infants. In older children and in adults two types of tests have been employed, the injection of insulin alone and the administration of insulin combined with a standard amount of dextrose.[11] In the present study of infants, a simple dextrose tolerance test was first performed with 3 Gm. of dextrose per kilogram. After an interval of not less than five days the test was repeated, giving in addition ¼ unit of regular insulin per kilogram subcutaneously ten minutes after the patient began to drink the dextrose. The degree of sensitivity to insulin was measured by comparing the blood sugar level of the two curves one hour after the ingestion of the dextrose. This point in the two curves was selected for comparison to avoid errors caused by the temporary hyperglycemic action of impurities in commercial insulin preparations and to minimize the effects of variations in the rate of absorption of the dextrose.

As will be seen in table 6, the dose of ¼ unit of regular insulin per kilogram of body weight results in a definite lowering of the blood sugar curve but without hypoglycemia in the group of normal children studied. Larger doses of insulin proved unsatisfactory because of the development of hypoglycemia, which confused the picture by stimulating the mechanism for raising the blood sugar level. Comparison of the blood sugar curves obtained with and without insulin showed an average difference of 45 mg. per hundred cubic centi-

TABLE 5.—*Average Blood Sugar Curves of Normal Infants Following the Injection of One Gram of Dextrose per Kilogram of Body Weight Intravenously*

No. of Cases	Blood Sugar, Mg. per 100 Cc.					
	Fasting	Minutes After Dextrose				
		10	30	60	90	120
15	85±4	325±11	225±14	128±23	83±3	78±3

TABLE 6.—*Average Blood Sugar Curves Obtained in Insulin Sensitivity Tests of Normal Infants*

Number of Cases	Dextrose, Gm. per Kg. of Body Wt.	Insulin, Unit per Kg. of Body Wt.	Blood Sugar, Mg. per 100 Cc.				
			Fasting	Minutes After Dextrose			
				30	60	120	180
9	3	0	86±2	132±5	170±4	128±6	87±5
10	3	¼	84±3	117±7	125±5	84±3	80±2
Average difference			.....	15	45	44	7

8. Fries, M. E., and Kohn, J. L.: Am. J. M. Sc. **170:** 547-563, 1925. Svensgaard, E.: Acta pædiat. (supp. 4) **12:** 1-6, 1931. Badenoch, E., and Morris, N.: Quart. J. Med. **5:** 227-250, 1936. Ross, C. W.: Arch. Dis. Childhood **13:** 289-309, 1938.
9. Crawford, T.: Arch. Dis. Childhood **13:** 69-77, 1938.
10. Tunbridge, R. E., and Allibone, E. G.: Quart. J. Med. **9:** 11-35, 1940.
11. Gilchrist, M. L.: Arch. Dis. Childhood **7:** 169-180, 1932. Kantrow, A. H., and Boyd, J. D.: Blood Sugar in Diabetes in Children, Am. J. Dis. Child. **54:** 1005-1011 (Nov.) 1937. Himsworth, H. P., and Kerr, R. B.: Clin. Sc. **4:** 1-17, 1939. Fraser, R. W.: Albright, Fuller, and Smith, P. H.: J. Clin. Endocrinol. **1:** 297-306, 1941. Himsworth [2] (second reference). Badenoch and Morris.[8]

meters one hour after the administration of the dextrose with relatively small variations (56 to 31) from this. For use in small infants, therefore, the technic employed in the present study appears to be a satisfactory means of evaluating insulin sensitivity.

THE EPINEPHRINE TEST

The ability of the liver to convert glycogen into dextrose and to discharge the dextrose into the blood stream can be studied grossly by the subcutaneous administration of epinephrine. After preliminary trials, a test dose of 0.03 cc. (½ minim) of a 0.1 per cent solution of epinephrine hydrochloride per kilogram of body weight was found to be satisfactory. The preceding diet, the fasting period and the time for taking blood samples were the same as for the dextrose tolerance test. The results are shown in table 7. In the 10 patients studied, the maximal rise in blood sugar occurred in one hour in 9 of them and in one-half hour in 1. These findings are in general agreement with those obtained by other workers in studies of older children and of adults.[12]

TABLE 7.—*Average Blood Sugar Curve Obtained After the Administration of Epinephrine Subcutaneously to a Group of Normal Infants*

Number of Cases	Epinephrine, Cc. per Kg. of Body Weight	Blood Sugar, Mg. per 100 Cc.						
		Fasting	Minutes After Injection				Maximal Rise	Minimal Rise
			30	60	120	180		
10	0.03	80±3	123±4	143±5	104±8	76±2	71	40

LEVULOSE AND GALACTOSE TOLERANCE TESTS

The so-called carbohydrate liver function tests, namely the levulose and galactose tolerance tests, give an index of the rapidity with which these sugars can be converted into dextrose and stored as glycogen. The literature on the subject has been reviewed by Tomlinson,[13] who lists many investigations done since the original work of Strauss[14] in 1901. Strauss observed that, whereas only 10 per cent of normal subjects showed levulose in the urine following the ingestion of this sugar, the phenomenon was manifested in 90 per cent of subjects having disorders of the liver. Shirohauer[15] modified the procedure of Strauss by introducing total blood sugar estimation in place of urinary sugar excretion. Various improvements in technic have been proposed from time to time[16] so that, at present, methods are available for determining levulose or galactose in the blood directly. The simpler procedure, however, of determining the rise in total blood sugar after the ingestion of a standard quantity of the sugars has been employed in the present study. The technic consisted in the administration of 1 Gm. and 1.75 Gm. of levulose or galactose per kilogram of body weight to a group of normal infants after the usual twelve hour fasting period and the determination of the total blood sugar response. The figures obtained represent the sum of the basic dextrose value and the additional concentration of the levulose or galactose.

TABLE 8.—*Average Total Blood Sugar Curves Following the Oral Administration of Levulose*

Number of Cases	Levulose, Gm. per Kg. of Body Weight	Blood Sugar, Mg. per 100 Cc.						
		Fasting Level	Minutes After Levulose				Maximal Rise	Minimal Rise
			30	60	120	180		
10	1.0	77±4	82±3	87±5	78±3	75±3	22	4
10	1.75	78±3	89±3	95±2	83±3	78±2	21	11

As will be seen in table 8, following the ingestion of 1 Gm. of levulose per kilogram of body weight the maximal and minimal increases in the blood sugar level were 22 and 4 mg. per hundred cubic centimeters respectively. In the 10 patients studied the maximal rise occurred in one hour in 8 of them and in an equal number the return to the fasting value occurred within two hours. Our results are in agreement with those of Tallerman[17] in showing that a larger test dose of levulose makes no appreciable change in the blood sugar response.

Similar studies were made using galactose instead of levulose. As will be seen in table 9, wide variations were obtained. Since total blood sugars were estimated, it is impossible to conclude whether the sharp rise in sugar level observed in some patients was due directly to the increase in blood galactose or whether the galactose stimulated the formation of dextrose from glycogen. In either case the lack of consistency in the response of normal infants created doubts concerning the usefulness of the procedure as an index of liver function in children of this age.

TABLE 9.—*Average Total Blood Sugar Curves Following Oral Administration of Galactose*

Number of Cases	Galactose, Gm. per Kg. of Body Weight	Blood Sugar, Mg. per 100 Cc.						
		Fasting Level	Minutes After Galactose				Maximal Rise	Minimal Rise
			30	60	120	180		
10	1.0	81±5	96±6	98±3	88±4	80±4	42	6
10	1.75	81±2	121±20	118±15	108±8	80±10	94	13

COMMENT

For the recognition of clinical disturbances in carbohydrate metabolism, the dextrose tolerance test has become an accepted procedure. In the absence of glycosuria it frequently calls attention to a hidden abnormality. While the test is simple to carry out, its interpretation is complex. An unusually high and prolonged curve, so commonly considered to be evidence of a "decreased tolerance," means merely that the sum of the rates of disappearance of sugar from the blood (storage, utilization and excretion) falls short of the rate of absorption of the ingested sugar. The opposite may be said of the low or flat curve, usually interpreted as evidence of "increased tolerance." Little can be inferred concerning the adequacy of the specific functions involved.

If progress is to be made in our understanding of disturbances in carbohydrate metabolism, means must be available for evaluating such important phases as (1) rate of absorption, (2) ability to build up glycogen reserves, (3) ability to maintain a normal blood sugar level by glycogen breakdown or, when the glycogen reserves are consumed, by protein breakdown and (4)

12. Enocksson, B.: Acta med. Scandinav., supp. 45, 1932. Gjertz, A., ibid. **88:** 464-477, 1936. Mainzer, F., ibid. **100:** 231-243, 1939. Gilchrist.[11]
13. Tomlinson, R. W.: Delaware State M. J. **6:** 199-211 (Sept.) 1934; **7:** 230-243 (Oct.) 1934.
14. Strauss, Hermann: Deutsche med. Wchnschr. **27:** 757, 1901.
15. Shirohauer, H.: Ztschr. f. klin. Med. **78:** 462, 1913.
16. Scott, L. D.: Brit. J. Exper. Path. **16:** 489-496, 1935. Althausen, T. L., and Wever, G. K.: J. Clin. Investigation **16:** 257-259, 1937. Herbert, F. K.: Brit. M. J. **1:** 867-870, 1939. Thompson, J. C., and Wilkinson, A. W.: Edinburgh M. J. **47:** 250-261, 1940. Maclagan, N. F.: Quart. J. Med. **9:** 151-162, 1940.
17. Tallerman, K. H.: Quart. J. Med. **17:** 37, 1923.

ability of the tissues to use dextrose. At the present time, too little is known concerning the fundamental physiology of these integral processes of metabolism to make it possible to apply procedures to clinical problems with entirely satisfactory results. The hope of progress lies in becoming able to interpret abnormal blood sugar curves in terms of disturbances in the physiologic processes involved. The present study was undertaken with this point of view in mind.

The conditions under which tests of carbohydrate function are performed are of necessity somewhat different with small infants than with older children or adults. The standard overnight fast preceding the test for adults has no counterpart in small infants receiving feedings every three or four hours throughout the day. Formula feedings vary widely in proportions of fat, protein and carbohydrate with appreciable effects on the "dextrose tolerance." And, in addition, an inadequate caloric intake of both children and adults can affect the test by forcing the metabolism to draw on the fat depots instead of utilizing a normal diet of the usual proportions. It is important, therefore, both in infants and in adults, that the conditions preceding the test be maintained constant in order that satisfactory comparison with standards may be possible.

In the present study a fast of twelve hours preceding the test has been found satisfactory for full term infants up to 2 years of age. While the data reported show relatively small differences between the blood sugar curves obtained after a six and twelve hour fast, the shorter one would frequently fail to bring out a hidden tendency to fasting hypoglycemia, which is important to know. The twenty-four hour fast is obviously too long, for even normal infants may exhibit hypoglycemia, ketosis and an abnormal blood sugar curve at this time. In the case of premature infants weighing less than 2.5 kilograms and receiving feedings every two or three hours throughout the day, it seems advisable to reduce the fasting period somewhat. Such infants quite probably have a smaller glycogen reserve than full term and older children, and a shorter fasting period would therefore be comparable to the twelve hour fast of normal infants. In no case, however, should the fast be less than nine hours.

Too frequent repetition of the dextrose tolerance test also affects the results. John [18] demonstrated this fact by performing daily tests on the same patient for five successive days, using the same dose of dextrose each time. The results of the experiment showed that on the first day the hyperglycemia reached a peak of 260 mg. per hundred cubic centimeters, with a return to normal at the end of three hours. On the fifth day the peak was only 90 mg. per hundred cubic centimeters. From this and other reports it has therefore seemed advisable to repeat tests of carbohydrate function at intervals of not less than five days.

It has sometimes been stated that the quantity of dextrose administered was relatively unimportant. Our experience indicates that this is not the case with infants, for the blood sugar curves resulting from doses of 1, 1.75 and 3 Gm. of dextrose per kilogram of body weight are distinctly different and show no overlapping. The smallest dose not infrequently gives a low curve which might easily be confused with the flat curve seen in certain diseases. Using the dose of 1.75 Gm. per kilogram equivocal results are sometimes obtained, but in our experience the large dose of 3 Gm. per kilogram for infants under 2 years of age has been most satisfactory, differentiating clearly between normal, low and high curves. We therefore believe that 3 Gm. of dextrose per kilogram of body weight should be adopted for use with infants under 2 years, and a somewhat smaller amount for older children to be comparable to the dose of 1.5 Gm. per kilogram which has proved satisfactory for adults.

Rate of absorption undoubtedly plays a role in the type of blood sugar curve obtained. Such conditions as celiac disease, intestinal tuberculosis and pressure from enlarged viscera are known to interfere with absorption, while intestinal hypermotility, gastroenterostomy, hyperthyroidism and emotional disturbances may speed up absorption. All low or flat blood sugar curves should of course be considered as possibly resulting from delayed absorption. Our experience with adults suggests that curves rising to a high level in one-half hour often mean increased rate of absorption. An index of the normality of the absorptive mechanism may be obtained by comparing oral with intravenous curves or with curves obtained by placing the dextrose directly into the duodenum by stomach tube, and by tests of intestinal motility, since rate of absorption appears to bear some relationship to peristaltic activity. For the intravenous test in infants we have found 1 Gm. of dextrose per kilogram given over a period of two to four minutes to be satisfactory, the blood sugar returning to the original fasting level within one and one-half hours after the administration of the dextrose. The blood sugar levels at ten minutes and one-half hour appear to have no significant utility and can be omitted without loss.

Glycogen deposition cannot, of course, be measured directly in human beings. However, the fasting respiratory quotient of animals has been shown to vary with the glycogen content of the liver, and it is well known that in human beings the fasting respiratory quotient depends directly on the composition of the diet.[19] At present, experiments are in progress designed to utilize the stability of the respiratory quotient during fasting as an index of glycogen reserves. A report of this aspect of the work will be published later. For the present, in the absence of respiratory data on the general metabolism of the individual, one must interpret carbohydrate storage and utilization together from the height and the rate of fall of the blood sugar curve, eliminating if possible abnormalities in the absorptive mechanism.

The nature of the contribution of insulin to carbohydrate metabolism is as yet not entirely clear, although its action in promoting the deposition of glycogen in the muscle and in inhibiting the new formation of dextrose from protein appears definite. It seems likely that the former function is responsible for the lowering of the blood sugar in the usual clinical insulin sensitivity tests.[20] To demonstrate abnormal sensitivity to insulin, we believe that a comparison of a simple dextrose tolerance test with a later similar test accompanied by a subcutaneous injection of ¼ unit of insulin per kilogram gives the most satisfactory results in infants. This test has several advantages over others commonly employed. In the first place, it eliminates the need for intravenous injections, which in infants are both difficult and disturbing. In the second place, it does not induce hypoglycemia,

18. John, H. J.: Personal communication to the authors.

19. Bridge, E. M.: Bull. Johns Hopkins Hosp. **61:** 349-357, 1937. Benedict, F. G., and Higgins, H. L.: Am. J. Physiol. **30:** 217-232, 1912.

20. Bridge, E. M., and Winter, E. A.: Bull. Johns Hopkins Hosp. **64:** 257-272, 1939.

which in turn stimulates the adrenal-sympathetic mechanism for dextrose formation from liver glycogen. The results obtained by this technic give, we believe, a more accurate picture of insulin sensitivity, and in addition the test is easy to perform.

To test the mechanism that controls the supply of dextrose to blood and tissue is by no means simple, but some help may be obtained in the following two ways: (*a*) The function of glycogen breakdown to form dextrose can be evaluated roughly from the action of epinephrine in raising the blood sugar level. If the liver contains little or no glycogen, as in starvation, or if the glycogen is abnormally stable, as in glycogen disease, epinephrine induces little or no rise in blood sugar. Under ordinary conditions, however, in which liver glycogen is at a normal level, the subcutaneous injection of 0.03 cc. (½ minim) per kilogram of a 0.1 per cent solution of epinephrine to infants gives a rise in blood sugar level similar to that obtained in a dextrose tolerance test. (*b*) When glycogen reserves are no longer available, it is well known that protein is broken down to form dextrose. A simple test of this function is to observe the ability of the individual to maintain a normal blood sugar level during starvation. Healthy infants do not show hypoglycemia after a fast of twelve hours but may if the fast is continued for eighteen to twenty-four hours. In contrast to this, infants who have some difficulty in forming dextrose from protein will show hypoglycemia after twelve hours and in some instances after only five hours without food. Thus in infants the epinephrine test and the control of the blood sugar level during fasting offer means of evaluating another phase of carbohydrate metabolism.

As an additional test of the carbohydrate aspects of liver function, levulose and galactose tolerance tests have been employed. Normally these sugars are converted into dextrose and deposited as glycogen so rapidly that only a small amount passes through the liver to increase the blood sugar level. Various procedures for the test have been tried in the past. The technic that we have found satisfactory for infants is to give 1 Gm. of levulose per kilogram under the same conditions as in the dextrose tolerance test and to follow the blood sugar similarly. With infants the galactose test has been found so variable as to be of little value. The levulose test, however, appears satisfactory, although it has limitations. For example, if the fasting blood sugar value is abnormally low, the total glycemic response (which includes both levulose and dextrose) is unusually high and no conclusions can be drawn from the curve. This difficulty, however, can be overcome by the recent procedure of Thompson and Wilkinson,[16] who measure the actual concentration of blood levulose. The levulose tolerance test has been found useful as an index of liver function in a variety of diseases.

SUMMARY

A group of normal infants has been studied in order to standardize more satisfactorily the various tests of carbohydrate metabolism. The following technics can be recommended for children under the age of 2 years:

(*a*) Preceding diets: normal caloric intake and normal proportions of fat, carbohydrate and protein for several days. The tests should not be repeated at intervals of less than five days.

(*b*) Fasting period: twelve hours for infants receiving three, four or five feedings a day, nine hours for prematures and those receiving six or more feedings.

(*c*) Dextrose tolerance test: a test dose of 3 Gm. of dextrose per kilogram of body weight.

(*d*) Intravenous dextrose tolerance test: 1 Gm. of dextrose per kilogram in 50 per cent solution given over a period of two to four minutes.

(*e*) Insulin sensitivity test: ¼ unit of regular insulin per kilogram given subcutaneously ten minutes after the ingestion of 3 Gm. of dextrose per kilogram is begun. A control test without insulin is necessary for comparison.

(*f*) Epinephrine test: 0.03 cc. (½ minim) of a 0.1 per cent solution of epinephrine hydrochloride per kilogram given subcutaneously.

(*g*) Levulose tolerance test: 1 Gm. per kilogram.

THE TREATMENT OF PRIMARY DYSMENORRHEA WITH ESTRIOL GLYCURONIDE

A CONTROL STUDY

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The treatment of essential dysmenorrhea has been one of the most difficult problems for the gynecologist. So little is known of the cause or causes of painful menstruation that methods of treatment that have been used have been almost entirely empirical. Until the past few years, when great advances have been made in our knowledge of the relation of the endocrine glands to the menstrual function, the treatment of dysmenorrhea has consisted largely in the use of analgesics or sedatives, antispasmodics or surgery. More recently, with preparations of ovarian and sex stimulating pituitary hormones available, numerous reports have appeared in the literature on the efficacy of various endocrine preparations in relieving dysmenorrhea. Many investigators have reported encouraging results with the administration of estrogenic substance, particularly to women in whom the uterus was found to be small, anteflexed and hard. Other investigators, notably Novak, have advanced the theory that estrogen, which experimentally has been shown to increase the contraction of uterine muscles, is not as logical a therapeutic agent in the treatment of menstrual pain as is progesterone, which experimentally inhibits uterine contraction. Good results in the treatment of dysmenorrhea have been claimed with both estrogen and progesterone. More recently experimental and clinical studies have shown that testosterone propionate will reduce uterine contractions and in certain cases prevent dysmenorrhea. In all these reports, however, one is impressed with the fact that few attempts have been made to evaluate the results of the various endocrine preparations by a controlled clinical study. It seems especially important in evaluating the effects of any treatment for a condition such as dysmenorrhea, in which the psychogenic factor has long been recognized as exceedingly important, to control carefully the results of any therapeutic agents used.

This study presents the results of the treatment of dysmenorrhea in a group of 100 girls, 50 of whom were given estriol glycuronide extracted from human

From the Students' Health Service, University of Minnesota. This study was carried out with the aid of a grant from the Medical Research Fund of the University of Minnesota.

placentas and 50 a placebo.[1] Estriol glycuronide (emmenin) was first announced by Dr. J. B. Collip as an alcohol soluble ether insoluble substance present in acetone extract of human placentas, active orally and partially estrogenic in immature rodents with intact ovaries, though relatively inert in ovariectomized animals. Collip concludes that, since emmenin is ineffective in the castrate, it functions directly or indirectly by stimulation of the intact ovary, thus differing from estrogen. However, its primary effect is estrogenic in character. Campbell and Collip[2] in 1930 reported 36 cases of dysmenorrhea in which estriol glycuronide was administered, with 26 cases showing definite improvement. There were no controls. Several similar reports have appeared in the literature during the past eight years. Goldberg and Lisser[3] in 1935 reported 40 cases of dysmenorrhea in which estriol glycuronide was administered. The estriol glycuronide failed utterly in 8 cases, was of doubtful value in 7, produced definite improvement in 12, and achieved brilliant results in 13. In other words, in 25 of 40 cases, or over 60 per cent, either entire relief or pronounced improvement was obtained.

The group of 100 young women included in this study were all students at the University of Minnesota, ranging in age from 17 to 25 years. Each student was given a general physical examination, including an estimation of the hemoglobin, a basal metabolism test and a pelvic examination. No cases were included in which any pelvic abnormality was noted. All were considered cases of primary dysmenorrhea. In order to rule out any psychic effect of the treatment, a prescription for "dysmenorrhea tablets" was given to each patient. The pharmacy then dispensed estriol glycuronide tablets and a placebo tablet identical to the estriol glycuronide tablet in appearance, to each alternate student. The estriol glycuronide results obtained were recorded by us with no knowledge of which of these tablets the patient was taking. The estriol glycuronide tablets which were furnished us at the time were not quite equivalent to 1 drachm (4 cc.) of the liquid estriol glycuronide. We therefore gave each patient 6 tablets daily. The tablets were given for ten days before the calculated menstrual period. All patients were treated

TABLE 1.—*Duration of Treatment*

	Total No. of Cases	3 Mo.	4 Mo.	5 Mo.	6 Mo.	7 Mo.
Estriol glycuronide with complete relief	6	2	2	1	1	..
Placebo with complete relief	4	2	1	..	1	..
Estriol glycuronide with partial relief	18	9	2	3	4	..
Placebo with partial relief	17	8	4	4	1	..
Estriol glycuronide with no relief	26	14	7	3	1	1
Placebo with no relief	29	20	8	..	1	..

for at least three months and observed either personally or by letter for about one year. The patients were divided into three groups: those who experienced complete relief, those who had partial relief and those who had no benefit whatever from the medication. Table 1 shows the number of months the treatment was continued in each of the three groups.

Six of the 50 taking estriol glycuronide tablets and 4 of the 50 taking the placebo tablets reported complete relief from menstrual pain. All of the patients in both the therapeutic and the placebo groups had complete relief the first period after taking the medication and were free from pain every period while under treatment. Nine of the 10 students in this group reported that they have had no recurrence of symptoms since the onset of treatment, which is a period of nine to twelve months. The 1 student who had a recurrence of symptoms after discontinuing her medication wrote to us for a copy of her prescription. She had been unable to be up on her feet the first day of her menstrual period prior to medication but had complete relief while on treatment. Her record disclosed that she had been taking the placebo tablets. This illustrates the difficulty encountered in evaluating results from any type of medication for dysmenorrhea.

TABLE 2.—*Results*

	Total Number	Complete Relief		Partial Relief		No Relief	
		No.	%	No.	%	No.	%
Estriol glycuronide	50	6	12	18	38	26	52
Placebo	50	4	8	17	34	29	58

Eighteen of the 50 on estriol glycuronide and 17 of the 50 on the placebo tablets obtained partial relief from the medication. Thirteen of those taking estriol glycuronide in this group had complete relief the first period after treatment but did not have consistent benefit during subsequent periods. Some periods were free from pain while in others the medication produced no effect. In 4 of the group on estriol glycuronide, no benefit was obtained the first period after treatment but there was complete relief the second period while under treatment. In the group classified as obtaining partial relief who were taking the placebo tablets, 12 were free from pain the first period after taking the medication and 4 had no benefit the first period but definite relief the second period. As with those on estriol glycuronide, there was no consistency in the effects of the treatment during subsequent periods. All of these were followed from nine to twelve months after the onset of treatment.

Twenty-six, or 52 per cent, of the group taking estriol glycuronide and 29, or 58 per cent, of those given the placebos reported no relief whatever. The results of this controlled group of cases show such a small difference between the therapeutic and the control group that one questions the earlier reports on the benefit of estriol glycuronide in the treatment of dysmenorrhea in studies which have not been so controlled. Although the results of this study are negative, they show the importance of controlled clinical studies in the evaluation of therapeutic agents, particularly in a condition in which there is a known psychogenic factor.

SUMMARY

In a controlled study of the use of estriol glycuronide in the treatment of dysmenorrhea, the subjects were 100 unmarried young women between the ages of 17 and 25, all with primary dysmenorrhea. Fifty of the group were given estriol glycuronide tablets, and the other 50 were given placebo tablets indistinguishable from the estriol glycuronide tablets.

Twelve per cent of the group receiving estriol glycuronide and 8 per cent of the group receiving placebos reported complete relief from dysmenorrhea for a period of nine to twelve months. Thirty-eight per cent of

1. The placebo tablets were furnished through the courtesy of the Ayerst McKenna Company.
2. Campbell, A. D., and Collip, J. B.: On the Clinical Use of the Ovary-Stimulating Hormone of the Placenta, Canad. M. A. J. **23**: 633 (Nov.) 1930.
3. Goldberg, Minnie B., and Lisser, Hans: On the Clinical Use of Emmenin, Endocrinology **19**: 649 (Nov.-Dec.) 1935.

those receiving estriol glycuronide and 58 per cent of those receiving the placebos obtained no relief whatever.

This study shows the need for careful controls in the evaluation of any therapeutic measures, particularly in a condition which may have as many psychogenic factors as does dysmenorrhea.

REGENERATION OF UTERINE MUCOSA AFTER SPONTANEOUS ABORTION AND NORMAL DELIVERY

THE THERAPEUTIC INDICATIONS

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Even before the distraught patient completes her spontaneous abortion her first question is "Why can't I carry a baby?" Her next questions are "When can I try again?" and "Can't you give me some treatment which will help me carry through?"

Extensive literature shrouds the moot question of what is the matter with the patient. Equally extensive literature propounds various therapeutic efforts. This paper proposes to treat the question of when the patient is prepared (so far as the uterine mucosa and ovulatory processes are concerned) for her next pregnancy.

Dr. J. Whitridge Williams has summarized in classic fashion the investigations made into the problem of the regeneration of the uterine mucosa, and his special interest effectively completed our knowledge of the fate of the placental site. His two papers [1] exhaustively review the entire field as well as illustrate lavishly his own observations made in 19 cases. The first paper,[1a] published posthumously, unifies our knowledge in this fashion: "The mucosa of the cervical canal is restored by the end of the first week. Outside of the placental site, the endometrium becomes regenerated during the course of the third week. The placental site persists from six to seven weeks, and its disappearance is effected by a process of exfoliation which in great part results from undermining by endometrial tissue."

The process of regeneration of the mucosa was noted to be effected with great rapidity. Every physician is familiar with the speed with which the mucosa is restored following menstruation. Often before flow is completed the process of repair takes place from the stumps of the basal glands, covering the denuded stroma with new epithelium. The basal stroma usually fails to undergo cyclic changes. Werth [1a] in 1895 demonstrated a similar, slightly slower regeneration following curettage. Williams [1a] noted that this regeneration was significant in the postpartum uterus within five days. Our series demonstrated this change, beginning in from twenty-four to forty-eight hours. Between the twelfth and twentieth day Williams noted complete regeneration of surface epithelium, glands and stroma. None of the writers he cites noted mitotic activity during the first two weeks in the uterine epithelium.

Kronig [1a] in 1901 noted that separation of the placenta and membranes usually occurs in the spongy layer of decidua, yet the amount of decidua retained varies greatly from a few cell layers to a thickness of several millimeters. There is always sufficient mucosa retained at the placental site to guarantee regeneration of the new membrane, whereas the cervical mucosa remains intact. Kronig also mentions that puerperal infection does not delay regeneration.

The basal stroma, which undergoes decidual change throughout its entire thickness in full term pregnancy, regresses into the nonspecific stroma with which all physicians are familiar. Williams pointed out that the final step in the exfoliation of the placental site takes from six to seven weeks and that it is not effected by absorption in situ but that instead the process is one of exfoliation of the site. The arteries undergo obliteration and hyaline degeneration, and the veins become thrombosed and organized. The endometrium from the margins of the site grows inward, aiding in the separation, which is helped to a lesser degree by the regeneration beneath the placental plaque. This Williams stated, is a mechanism of Nature's which prevents the scarring of the endometrium with each pregnancy, which would limit ultimately the number of pregnancies that any one uterus could prepare.

On the other hand, the postabortal uterus poses a slightly different problem. The wave of decidual change is initiated locally at first around the implantation site but requires at least eight weeks before it involves the entire endometrium.[2] Should the abortion be of a pathologic ovum whose development was arrested early, decidualization may be interrupted long before it is complete. Here the speed of regeneration of the endometrium would presumably be greater than that in the postpartum uterus.

Yet, again, it is accepted generally that lactation will inhibit ovulation to some extent. The exact mechanism is not known, but a few of our patients know of this happy phenomenon. One Italian housewife nursed her child until he was nearly 6 years of age in a contraceptive effort which was successful.

This study was undertaken in an effort to illuminate the therapeutic advice which can be extended to patients.

REGENERATION OF THE UTERINE MUCOSA FOLLOWING NORMAL FULL TERM DELIVERY

Although many others have already described these changes, we undertook for our own information to obtain pathologic sections depicting these changes in uterine mucosal regeneration exclusive of the placental site. Twenty-five cases were included in this study. Rather than to take a biopsy specimen from or curet the same patient daily, or even at longer intervals, it seemed reasonable to spread the series so that 1 patient would furnish a specimen immediately after delivery, another twenty-four hours post partum, another the second day post partum and so on. In this way infection was avoided and an unobscured pathologic picture was obtained. None of the patients used were abnormal or febrile and none presented complications. Specimens were removed by generous suction curettage of the anterior and posterior walls without anesthesia. Tissue was put directly into 10 per cent solution of formaldehyde as a fixative and stained with hematoxylin and eosin. It was felt that selecting 14 normal patients

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Read in part before the New England Pathological Society, Oct. 16, 1941.

Dr. Frederick C. Irving and Arthur T. Hertig contributed their criticism and stimulating guidance.

From the Department of Obstetrics, Harvard Medical School, and the Pathology Department, Boston Lying-in Hospital.

1. Williams, J. W.: (*a*) Regeneration of Uterine Mucosa After Delivery, Am. J. Obst. & Gynec. **22**: 664-696 (Nov.) 1931; (*b*) Disappearance of the Placental Site During the Puerperium, J. A. M. A. **97**: 523-528 (Aug. 22) 1931.

2. Sturgis, S. H.: Am. J. Obst. & Gynec. **35**: 752-761 (May) 1938.

at random for single specimens would give an average rate of repair. Briefly, the scale of regeneration followed the pattern of the specimens described here:

1. Immediately postpartum: showed multinucleated, vacuolated decidual cells, possibly giant cells at placental site, with an occasional thrombotic vessel and focus of necrosis and with regressing polymorphonuclear leukocytic infiltration.

2. First day postpartum: showed beginning regeneration of the glands and surface epithelium, degeneration and regression of decidua, with exudate and thrombotic vessels on the surface (fig. 1).

3. Second day postpartum: showed a blood clot and necrotic decidual slough.

4. Third day postpartum: showed surface slough and degenerative decidua, with regeneration of stroma and glands partially completed.

5. Fourth day postpartum: showed regressing but active decidual cells of basal decidua, continued gland regeneration and some slight mitotic activity. Necrotic decidua was still present.

6. Fifth day postpartum: showed regression of myometrium and decidua, regeneration of glands and surface slough still present (fig. 2).

7. Sixth day postpartum: showed thrombotic vessels and surface slough, with further regeneration of the glands

Fig. 1.—One day postpartum endometrium: The decidua is diffusely infiltrated with polymorphonuclear leukocytes, well defined thrombosis of vessels and necrotic decidua.

8. Seventh day postpartum: showed continued regeneration of surface epithelium, dense stroma much like ordinary basal stroma, empty vessels.

9 Eighth day postpartum: showed further condensation of stroma and continuing regeneration of the glands.

10. Ninth day postpartum: showed regeneration from the base of glands (wedged into the myometrium, possibly a protective mechanism), persistence of superficial slough, regenerating surface epithelium completely bridging the gap between glands, thin stroma, empty vascular channels (fig. 3).

11. Tenth day postpartum: showed superficial sloughing, regressing middle layer, completely regenerated basal layer, dense stroma, involuting myometrium.

12. Eleventh day postpartum: showed still some surface slough, regenerating endometrium yet trying to bridge the gaps, hemosiderin-laden macrophages and much more lower uterine segment than upper segment.

13. Twelfth day and thirteenth day postpartum: showed the glands completely regenerated, the surface epithelium completely covering the large majority of the stroma, the myometrium almost entirely regressed (fig. 4).

This series was completed by biopsies on 5 more normal convalescent patients who had failed to lactate and 6 patients who were lactating. The nonlactating patient on whom a biopsy was done on the twenty-first postpartum day had completely regenerated endometrium. No placental site tissue was found in her specimen. This endometrium was considered repairing endometrium with early proliferative activity. Some mitotic figures were seen in the glandular epithelium.

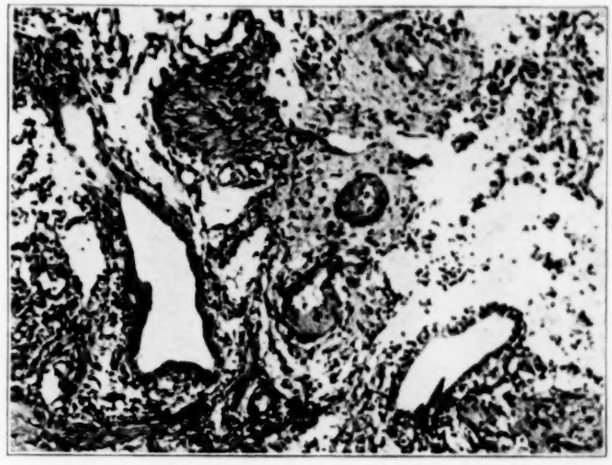

Fig. 2.—Five day postpartum mucosa: Some surface slough is still present, arteries are undergoing physiologic obliteration, regressing myometrium; stroma is edematous; glands are regenerating.

At four weeks, the specimen taken from another nonlactating patient showed mildly proliferating endometrium, hemosiderosis, still regressing decidua and a section of involuting placental site, demonstrating the changes described by Williams.

At five weeks, the endometrium was noted as resting endometrium, with no evidence of mitotic activity and with some hemosiderosis yet present.

At six weeks, there again was noted organization of the placental site, with mild proliferative activity of the endometrium. Occasional mitotic figures were seen. This is classified as late proliferative.

At eight weeks, the endometrium was two to three day menstruating endometrium.

Fig. 3.—Nine day postpartum mucosa: The mucosal surface is nearly complete; new epithelium is growing out of gland stubs; simple columnar glands, with several mitotic figures present; stroma is still edematous with no recognizable decidual cells.

To contrast with this presumably average rate of regeneration, ovulation and menstruation in the nonlactating patients, 6 patients were followed during the lactation period to discover the inhibiting effect of lactation.

At three weeks post partum, the specimen showed completely regenerated endometrium, with a few mitotic figures, proliferative glands with some subnuclear vacuolization and pseudostratification. Stroma is dense.

At four weeks post partum, there was no essential change except that more definite proliferative activity was noted.

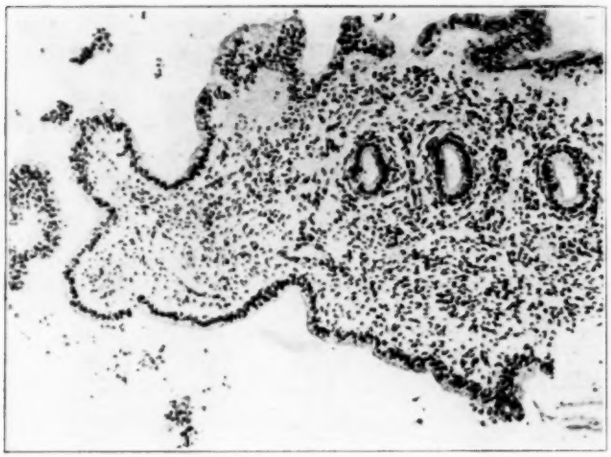

Fig. 4.—Thirteen day postpartum mucosa: Mucosal surface is complete, stroma is undifferentiated, dense, without cellular infiltration; glands are simple.

At five weeks, there was definite evidence of renewed secretory activity, suggesting that the patient had ovulated recently. There was still present some hemosiderosis, however.

At six weeks, the patient showed mild proliferative activity and evidence of old hemorrhage was still present.

At twelve weeks post partum, the patient showed twenty-three to twenty-four day secretory endometrium, pointing out that, despite continued lactation, she had ovulated and was due to have a period shortly. This she did have.

At fourteen weeks post partum, another lactating patient showed only mild proliferating activity, indicating that ovulation was still withheld even at this late date (fig. 5).

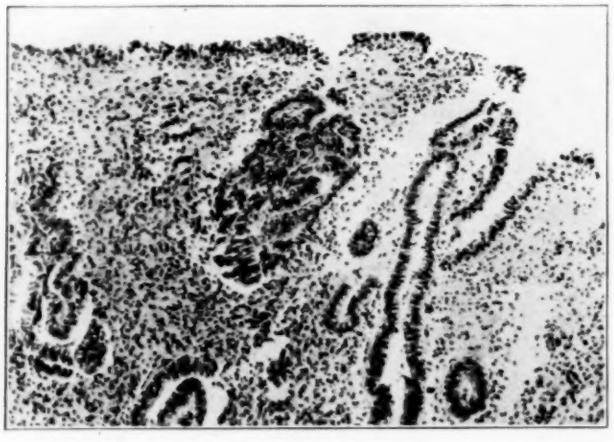

Fig. 5.—Biopsy specimen from a fourteen week postpartum lactating patient demonstrating complete repair of the mucosal surface, but the endometrium is arrested in mildly proliferating phase.

Apparently, then, patients who are lactating regenerate the endometrium at approximately the same rate as the nonlactating patients. However, if ovulation is inhibited, as by continued lactation, the endometrium tends to remain as resting or mildly proliferating endometrium, until at last the previous ovarian rhythmicity breaks through.

REGENERATION OF THE UTERINE MUCOSA FOLLOWING SPONTANEOUS ABORTION

An effort was made to follow 9 cases of spontaneous abortion in the first trimester of pregnancy by biopsies at intervals following abortion until ovulation and menstruation could be proved histologically. In these cases specimens for biopsy were taken three days after the abortion, again at seven days and then at weekly intervals until menstruation occurred. Four of these cases will be presented in some detail to illustrate the variations possible in the process of regeneration and the factors which may influence the rate of regeneration. The remaining 5 cases fall into one of these four groups.

Case 1.—Mrs. B. M., aged 37, a decipara, had had two previous nonconsecutive abortions. At six weeks she passed a pathologic ovum consisting only of intact ovisac without evidence of cord or embryo. She was curetted immediately to remove all loose tissue, of which there was but a slight amount—the decidua having separated with the ovisac. Biopsy on the third postpartum day showed acute polymorphonuclear leukocytic infiltration of early decidua, which consisted mostly of glands and fibrotic basal stroma. There were many thrombosed vessels present. Biopsy taken on the seventh day showed complete regeneration of the mucosal surface and glands which were numerous and slightly tortuous, showing some mitoses. There was beginning subnuclear vacuolization. Stroma had regressed to dense nuclei, with no evidence of decidual change.

Fig. 6 (case 1).—Biopsy twenty-one days after spontaneous abortion in which curettement was done immediately: early secretory endometrium. Patient has ovulated and she menstruated twenty-eight days after abortion, or seven days after this specimen was taken.

On the fourteenth day biopsy showed the endometrial phase continuing as described. On the twenty-first day there was definite early secretory activity in the glands, demonstrating ovulation (fig. 6). Dating was that of early secretory endometrium. Biopsy taken on the thirtieth day, two days after a normal period began, showed menstruating endometrium but as well an unchanged strip of mildly proliferating lower segment endometrium. The latter is notorious, however, for failing to mirror the cyclic changes found in the upper segment, so that it may be discounted.

Here, then, is a patient who had a spontaneous abortion of a pathologic ovum at six weeks, was immemediately curetted and had endometrial regeneration complete within seven days, ovulating on approximately the fourteenth day and menstruating on the twenty-eighth day. She continued thereafter on her previous twenty-seven to twenty-eight day cycle.

CASE 2.—Mrs. I. G., aged 18, a primipara, passed at four months a blighted ovum of approximately two and one-half months growth, the embryo macerated and showing multiple congenital anomalies as well as intrauterine amputation of a leg. The patient was not curetted, as all products of conception were identified.

Biopsy on the third day showed only necrotic decidua without evidence of regeneration. On the seventh day there were noted regenerating basal glands, compact stroma, probably basal, with middle and superficial regression, as well as degenerating decidua, and with complete regeneration of the surface epithelium. On the fourteenth day was noted resting endometrium, completely regenerated, but slight proliferative activity with no mitoses. On the twenty-first day there were no mitoses; certain areas suggested late proliferation, but in other areas there was still focal and diffuse necrosis, suggesting (as was confirmed by the thirty-five day biopsy) that some placental or decidual tissue was retained, that possibly a chronic endometritis was present and that ovulation had not taken place.

On the twenty-eighth day there was no change from the picture on the twenty-first day. On the thirty-fifth day the patient flowed (one pad of bright blood) and complained of cramps. Biopsy at this time showed regressing decidua (fig. 7). Flow was not menstrual-like. Immediately after this biopsy, on the thirty-sixth day, the patient flowed (four to six pads) and had cramps. This continued for six days. A biopsy was again taken on the fifty-third day. This specimen showed no inflammation, but there was still some predecidual reaction with stromal edema. The patient did not return until the one hundred and seventeenth day, at which time she requested an examination to determine whether she was pregnant. She was found to be, for biologic tests were positive, although the uterus had not yet begun to enlarge.

In this case, curettement after spontaneous abortion of a blighted, pathologic embryo was not carried out and regeneration of the superficial epithelium was again complete by the seventh day. However, possibly owing to retention of placental or decidual tissue or because of low grade infection, she failed to ovulate for at least two months after the abortion. Endometrium was restrained as resting or proliferating endometrium with focal areas of continued predecidual change, with chronic infiltration of inflammatory cells. Ultimately she did ovulate, but presumably at least three months after the abortion.

Fig. 7 (case 2).—Biopsy thirty-five days after a spontaneous abortion, in which curettement was not immediately done. Specimen elsewhere shows areas of still regressing decidua with chronic cellular infiltration. This slide shows resting endometrium, with no evidence of secretory activity and with chronic inflammation present.

CASE 3.—Mrs. I. G., aged 35, a secundipara who had had one abortion a year before, at eleven weeks began to bleed following a fall. Over the next three weeks she was given three successive courses of progesterone therapy, the last being 10 mg. of corpus luteum substance daily for seven days. Two days after the completion of therapy she began to bleed again. Definite tissues were not passed at any time, although all pads had been inspected. Immediate curettage was performed, but scant tissue was removed. A specimen for biopsy was taken nine days after the abortion, showing endometrium from the upper segment with a strong decidual reaction; glands were secretory and well preserved. There were foci of necrosis and infiltration of inflammatory cells throughout. Seen also was a well preserved placental site (fig. 8). Biopsy was not done again, but she failed to have a period for nine weeks. Since then, her periods have been grossly irregular, whereas her previous catamenia had followed regular cycles.

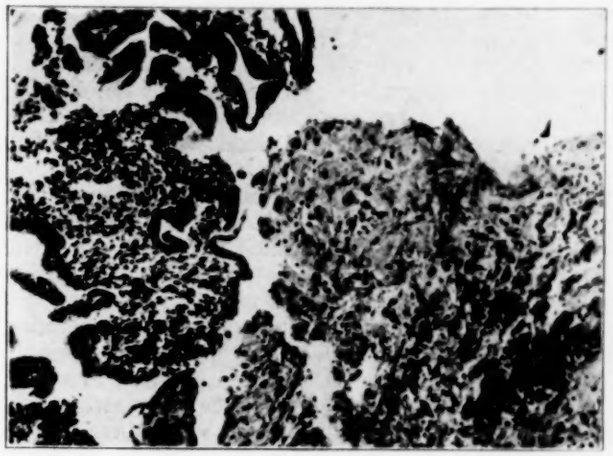

Fig. 8 (case 3).—Biopsy specimen nine days after abortion, in case in which curettement was done, after heavy progesterone therapy had been given to continue a blighted ovum: there is still adherent necrotic decidua, some placental site, with maintenance of secretory glands of pregnancy. There is no evidence of reparative activity.

This case may point out one of the possible hazards of heavy progesterone therapy, for involution and regeneration seemed to have been retarded, if this case is compared with case 1 (menstruation at twenty-eight days after spontaneous abortion with immediate curettage).

CASE 4.—Mrs. A. B., aged 30, a quartipara, had two previous nonconsecutive abortions. At eleven weeks the patient passed a pathologic ovum, which contained neither cord nor embryo, of an estimated size of six and one-half weeks. Biopsy taken immediately after the abortion procured a strip of endometrium from the upper segment which demonstrated that the necrotic decidual cast was undergrown by repairing and proliferative endometrium. This process had started apparently before the actual abortion had taken place.

COMMENT

These sequences of endometrial regeneration emphasize the therapeutic values which emerge. It would seem, as many writers have said, that the average postpartum patient is safe from pregnancy until ovulation recurs, which takes place on an average about six weeks after delivery. Four of the 5 nonlactating convalescent patients menstruated eight weeks after delivery—about 80 per cent in this small group. In the case of the lactating patient, menstruation is delayed for varying periods of time, but from the eighth week on the ovarian cycle may escape from pituitary inhibition and render the patient susceptible of pregnancy. Certainly, prolonging the lactation period will not be a wholly effective contraceptive measure. Conversely, for the patient anxious for reimpregnation, procreative activities may begin at will. Usually the tenderness has left the postepisiotomy perineum just before ovulation takes place in the nonlactating woman.

Of much more significance is the sequence following abortion. From the study of the 4 cases cited and 9 cases followed after spontaneous abortion, it would seem that in the ideal case of spontaneous abortion ovulation occurs within the first two to three weeks after abortion. There is no endometrial evidence submitted that this is not as good a time for impregnation as any other. Reid [3] has employed this period to great advantage in 4 cases of "chronic aborters." Our personal experience extends to 3 other cases in which impregnation occurred before the first period following abortion. This may save valuable time for the older patient hastening before the shadows of diminished ovarian function.

Equally striking is the fact that curettage may be worth while even though all products are identified as passed. As in case 1, in which curettage was done immediately, regeneration was prompt and ovulation took place some fourteen days after the abortion. In case 2, in which curettage was not done, regeneration and ovulation were delayed at least nine weeks, possibly by retained fragments of placenta or decidua or by chronic infection. No harm can be demonstrated in routine, gentle curettage. In many cases, because one cannot be certain that all tissues have passed, curettage is done. This would seem to guarantee that all morsels of the defeated ovum have been removed, thus allowing uninhibited regeneration to take place at maximum speed.

True, every one is familiar with the fact that placental polypi are not incompatible with a series of normal periods. Equally true is such a condition as that cited in case 4, in which even before the necrotic decidual slough separates repair is nearly complete. However, for certainty of removal routine curettage is advised.

CONCLUSIONS

1. Routine curettage is recommended in cases of spontaneous abortion, even though all products of conception have been identified as extruded.

2. The effect of heavy doses of progesterone in the treatment of threatened abortion is possibly that of delaying endometrial regeneration.

3. Patients may be urged to seek impregnation within two weeks after spontaneous abortion. Unless maternal health has been impaired seriously by the abortion, there are apparently no dangers of such a quickly imposed pregnancy.

4. Following normal full term pregnancy, the patient is susceptible of impregnation after six weeks, although lactation may inhibit ovulation for a longer period of time.

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3. Reid, D. E.: Personal communication to the authors.

Not Enough Imagination.—The simplest proposition in the social field today is that our people shall not go hungry. If we could kill ten million unemployed this year, another group of unemployed would exist next year. Something produces unemployment. While we are finding it and correcting it we must feed the victims. On that simple principle a great many other facts and actions depend. That is why I would call it a fundamental principle. Happily all can agree to it. We disagree only as to next steps. Science may find a way to make those steps more sure. Business may find a way. Government may find a way. All three may combine to find a way. It has been suggested and even attempted to combine these three groups of agencies but never with enough imagination or enough reliance on scientific method.—Bowman, Isaiah: Enduring Purpose, *Assn. Am. Coll. Bull.* **26**:194 (May) 1940.

INTRASPINAL OPERATIONS IN COMPENSATION CASES

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In the past seven years there has been rapid progress in knowledge concerning intractable low back and sciatic pain due to intraspinal pressure on the nerve roots. The lesions are intraspinal protusion of the intervertebral disk, thickening of the ligamentum flavum, or both. Whereas the scientific aspects of these cases have been adequately reviewed elsewhere,[1] this paper is being presented to emphasize the features of the management of such operable intraspinal lesions which have to do with workmen's compensation.

For best results, cooperation between the insurance carrier and the responsible surgeon is essential. However, many managers of insurance companies have had the impression, based perhaps on unfortunate experiences with osteoplastic and other spinal operations, that any spinal operation is rarely successful in a compensation case. It is natural that these men, in all sincerity, have urged injured workmen to avoid any spinal operation whatsoever. It is hoped that this paper will help clarify these problems and result in progress toward the common goal of all who deal with compensation cases, namely the prompt and permanent relief of disability.

CLINICAL MATERIAL

The incidence of these symptoms and the frequency with which operation has been performed may be illustrated by the following facts: In the past two and a half years 158 patients were examined because of low back and sciatic pain. Of this group it was suspected that 108 had an intraspinal lesion. Spinograms were performed in 50 cases and operation in 38 cases in which intractable low back and sciatic pain had not responded to prolonged nonoperative orthopedic management, which usually included a period of three weeks of complete bed rest. Of those patients who underwent operation at least four months ago, there were 12 who claimed that their disability was compensable. The management and end results of this complete series of 12 cases represent the gist of this report.

In this series there were 10 men and 2 women, who ranged in age between 29 and 53 years. The preoperative duration of symptoms varied from three months to fourteen years, averaging thirty-four months. The amount of time lost from work before operation ranged from two to sixty-three months, with the exception of 1 man who did office work and who had lost only three weeks from work although he had been suffering for over two years. All patients underwent operation between Oct. 27, 1939 and Oct. 10, 1941.

METHODS OF DIAGNOSIS AND TREATMENT

It is now established that most cases of prolonged severe sciatic pain are due to mechanical irritation of the nerve roots. The diagnosis of intraspinal pressure on nerve roots (probably intraspinal protrusion of the intervertebral disk, thickening of the ligamentum flavum, or both) was usually made on a clinical basis; that is, entirely on the history and physical examination.

Abridgment of a talk given to the Syracuse Claim Association on Oct. 6, 1941.

From the Syracuse University College of Medicine and the Syracuse University Hospital.

1. Bradford, F. K., and Spurling, R. G.: The Intervertebral Disk. Springfield, Ill., C. C. Thomas, 1941.

The most common symptoms and signs were history of onset while bending forward or straining, early development of backache, later development of sciatic pain, limp on the affected side, increase of pain on coughing, sneezing or bending, relief of pain with bed rest, pain and limitation of straight leg raising, limitation of flexion of the lumbar spine with flattening of the normal lumbar lordosis, list of back, paresthesia and sensory changes especially in the fifth lumbar and first sacral dermatome, diminished or absent ankle jerk, tenderness along the course of the sciatic nerve and increased total protein content of the spinal fluid. The most reliable sign of the exact level of the lesion was localized tenderness above or below the spinous process of the fifth lumbar vertebra (and, at times, a little to one side) with reproduction of sciatic pain by firm thumb pressure over this site.

Plain roentgenograms of the spine were used only in order to exclude other lesions, although a diminished intervertebral space above or below the fifth lumbar vertebra is suggestive of a protruded disk. Pneumograms of the lower spinal canal were made primarily to exclude a lesion above the level of the fourth lumbar vertebra and to obtain spinal fluid for laboratory study. Incidentally, it was determined whether root pain was produced with each injection of air. Occasionally the pneumogram itself helped convince the doctors representing the insurance company of the nature of the lesion and made for a more harmonious management of the case. In 1 case the pneumogram seemed normal, and operation was unnecessarily delayed. Such apparently normal pneumospinograms occur especially when the lesion is at the lumbosacral space, where there is plenty of room for an intraspinal lesion to be present between the vertebral pedicle and the dural sac without distorting the latter. Iodized oil was not used in any case because of the possible psychologic effect of the presence of this oil in the spinal canal or along the nerve roots, as shown in subsequent x-ray films. When one needle was used to inject the air as well as to obtain the spinal fluid, the pneumograms were only of limited value, as described. However, the use of two spinal needles may yield more complete filling of the dural sac. Furthermore, oblique views should yield a greater percentage of positive spinograms. It is important to emphasize however that, when a definite clinical diagnosis has been made, the presence of an apparently normal pneumospinogram should not contraindicate surgical treatment.

In order to relieve intraspinal pressure on the nerve roots, it is usually necessary to remove the thickened ligamentum flavum, intraspinal protrusions of the intervertebral disk, or both. In all these compensation cases, laminectomy of the fifth lumbar vertebra was performed. Laminectomy of the one vertebra permits exploration of the intraspinal surface of the intervertebral disk both above and below the fifth lumbar vertebra on both the right and left sides. The skin incision is usually 2½ inches long.[2]

OPERATIVE FINDINGS AND POSTOPERATIVE MANAGEMENT

In 1 case there was found only thickened ligamentum flavum, in 2 cases only intraspinal protrusion of the intervertebral disk, in 8 cases both thickened ligamentum flavum and protruded intervertebral disk, and in 1 case there was found congenital shortness of the dural sac. All the lesions were immediately above or below the fifth lumbar vertebra. In 1 case there was a protruded intervertebral disk at the fourth lumbar interspace and also thickening of the ligamentum flavum at the lumbosacral interspace.

The articular facets were not disturbed and the dura was not opened in any case. If the protruded disk was small and had not torn through the posterior longitudinal ligament, it was not removed; however, the nerve root was decompressed by adequate removal of lamina and ligamentum flavum. By leaving the posterior longitudinal ligament (and perhaps some strands of annulus fibrosus) intact, risk of recurrence of intraspinal protrusion of another portion of the disk was minimized. After laminectomy was performed, the patient was kept in bed ten days and in the hospital twenty-one days after operation. It was considered important not to prescribe a corset or brace in these cases because their use implies a weakness of the back and tends to undermine the patient's confidence in the strength of his back. Most patients were not permitted to return to their full time regular work until three months had elapsed after they had been dismissed from the hospital. However, it was found advisable to allow patients to return to light part time work after the second month.

When the time came to return to work, most patients became very nervous and apprehensive and required considerable reassurance. Frequently the sympathetic encouragement of the patient's spouse was of great assistance. In 2 cases amphetamine sulfate in doses of 5 mg. was prescribed for fatigue.

RESULTS

Every patient seems to have been promptly and permanently relieved of severe pain. No patient suffered any permanent ill effect from the operation. Except for patients 5 and 8, all returned to their regular work within four months after operation. The occupations represented were, in order, bookkeeper, truck mechanic, factory employee, office worker, laborer, linotyper, store clerk, laborer, machine operator, carpenter, sales woman and salesman. In a few cases there have persisted minor discomforts, such as feelings of fatigue or drawing sensations in the back and legs, especially after heavy exertion.[3]

Of the 8 patients whose claims for compensation were promptly accepted by the insurance companies every one returned to his regular work within four months after the operation. Of the 4 patients whose compensability was contested, 2 have returned promptly to their regular work. Although the other 2 patients (5 and 8) admit that they have no severe pain, they have not returned to regular work. They were both unskilled laborers but now refuse to do heavy work. Furthermore, both are receiving as much income now as they did before they were injured. As a matter of fact, 1 of these 2 is learning a new occupation by working as a clerk four hours a day without pay, and the other has applied for a light job.

2. Since this report was written, I have removed huge protruded disks in each of 2 additional compensation cases, utilizing only a hemilaminectomy of the fifth lumbar vertebra. In these cases diagnosis and localization were unusually definite. In 1 case a preliminary spinogram was done, and in the other not even a spinal puncture was performed. Both patients have had immediate and persistent relief from severe pain.

3. The latest report in each case is as follows (with time since operation indicated): twenty-six months, no pain at all; two years, no pain at all; twenty-two months, some discomfort but no severe pain; seventeen months, no severe pain; nineteen months, no pain at all; sixteen months, no pain at all; eleven months, no pain at all; seven months, no severe pain; seven months, no pain at all; seven months, some fatigue but no pain; five months, some discomfort when tired; four months, no pain at all.

FEATURES OF SPECIAL INTEREST FROM THE POINT OF VIEW OF WORKMEN'S COMPENSATION

A tear in the annulus fibrosus which results in protrusion of the disk or in the ligamentum flavum which leads to thickening is as much an accident as a tear in the ligament of the ankle. In the latter there are externally visible swelling and ecchymosis, whereas in the former the injury is deep in the body and the immediate disability may be only a slight backache. The pain caused by gradual thickening of the ligamentum flavum, progressive protrusion of the intervertebral disk or both is progressive and is due to pressure on the nerve roots. Hence the sciatica may not set in for days, weeks, months or even years later. The syndrome is characterized by exacerbations and remissions. The intermittent character of the pain is purely mechanical in origin. With more pressure on the nerve roots there is more pain.

In many cases the clinical diagnosis is clear, but often it is difficult to decide when operation should take place. I believe that all reasonable orthopedic measures should be used first. At least three weeks of bed rest, with or without traction on the affected leg, should be employed. Both the patient and his home physician must be convinced that nonsurgical treatment is ineffective. The patient should also have a period of time to think over the idea of operation, its risks and probable outcome and should actually request surgical intervention. Most patients are free from pain at rest, but, as the patient has to make a living, he should not be subjected to too long a period of suffering and rest before operation is performed. The more a person is away from his regular work, the more nervous and apprehensive he is when he thinks of returning to it. On the other hand, the presence of well defined neurotic symptoms should not be an absolute contraindication of operation, although it may make the prognosis somewhat guarded. I have seen many patients lose all their so-called neurotic symptoms as soon as they were relieved of long standing pain. Incidentally, it is advisable before operation to eliminate foci of infection which may be present in the teeth or prostate so as to avoid complications or delay in convalescence.

The patient should feel the sympathetic cooperation of the claim manager. This is one of the most important factors in maintaining his morale and getting him back to work. If possible, all questions of compensability should be settled prior to operation.[4] Finally, it is desirable to have the employer's cooperation in allowing the patient to return to work part time, without heavy lifting for the first month. Such cooperation allows him to regain self confidence and resume the habit of working.

SUMMARY

Twelve patients who suffered from intractable low back and sciatic pain and who claimed that their disability was compensable underwent intraspinal operation for decompression of the nerve roots. Ten of the 12 patients were found to have a protruded intervertebral disk, with or without thickening of the ligamentum flavum, above or below the fifth lumbar vertebra. All patients were relieved of severe pain. Ten of the 12 patients returned to their regular work within four months of operation. The 2 patients who failed to return to work were among 4 the compensability of whose injuries was contested. One of these 2 patients is doing clerical work several hours daily; the other has applied for a light job.[1]

4. Love, J. Grafton: Treatment of Protruded Intervertebral Disks, Minnesota Med. **23**: 692 (Oct.) 1940.

CONCLUSION

Compensable intraspinal lesions (protrusion of intervertebral disks and thickening of the ligamentum flavum) which cause intractable low back and sciatic pain that fails to respond to orthopedic management should undergo operation just as in noncompensable cases. Proper selection of patients and minimal neurosurgical intervention which is adequate to decompress the nerve roots, together with the cooperation of the insurance carrier, yield excellent results, both in terms of relief of pain and in return to regular work.

Physicians Building.

THE COLOSTRUM CUTANEOUS TEST FOR THE DIAGNOSIS OF PREGNANCY

A STATISTICAL ANALYSIS OF FIVE HUNDRED TESTS

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In a recent paper by Falls, Freda and Cohen[1] a cutaneous test based on the intradermal injection of human colostrum was described.

The theoretical background for the test was based on sensitivity to the colostral substances during the nonpregnant state and absence of sensitivity during pregnancy.

TECHNIC

The technic of the test in our study and the source of material utilized were made to conform as closely as possible to that of the original paper. Colostrum was obtained from primiparous pregnant women after at least twenty-eight weeks of pregnancy. The material was diluted to twice its volume with sterile isotonic solution of sodium chloride, and merthiolate solution was added as preservative.

One-fiftieth cc. of dilute colostrum and a similar quantity of isotonic solution of sodium chloride as a control wheal were injected intradermally in adjacent areas. Reactions were read at intervals of ten, thirty and sixty minutes. A papular elevation without pinkish areola was considered negative (positive reaction for pregnancy of Falls, Freda and Cohen). A pink areola of less than ¼ inch diameter was considered a 1 plus, of ½ inch diameter 2 plus, ¾ inch diameter 3 plus and an areola of 1 inch or more diameter with pseudopodic manifestations a 4 plus reaction. All reactions 2 plus or greater were considered positive reactions (so-called nonpregnancy result).

SOURCE OF MATERIAL

Persons selected for testing were chosen from the private practice and the various clinics of the Newark Beth Israel Hospital, consisting of a group of antepartum patients in various stages of pregnancy, a large group of endocrine patients, both male and female, and control groups of both normal and nonendocrine medical conditions among children, men and women. An analysis of the incidence of the various persons tested will be found in table 1.

From the Laboratories and Obstetrical Services of the Newark Beth Israel Hospital.

1. Falls, F. H.; Freda, V. C., and Cohen, H. H.: Skin Test for Diagnosis of Pregnancy, Am. J. Obst. & Gynec. **41**: 431 (March) 1941.

Persons 12 years of age or less were considered to be children. All patients diagnosed as endocrine on the basis of glandular stigmas, menstrual disturbance or menopausal phenomena and all other persons receiving endocrine therapy in any form were included in the endocrine disturbance groups. The pregnant patients varied from four weeks to forty weeks gravid. The postpartum group included all cases less than six months after delivery.

Among the nonendocrine, non-normal groups were cases of idiopathic sterility, anemia, cervical polyp, fibroids, anal fissures, hypertension, vaginitis, cystitis, habitual abortion, appendicitis, respiratory infections and heart disease.

The normal subjects consisted of resident physicians, laboratory technicians and general hospital personnel. In each instance a careful history was obtained to rule out the presence of either endocrine or nonendocrine disturbances.

FINDINGS

Of the total antepartum cases examined, comprising a group of 185 tests, 131, or 70.8 per cent, showed a negative reaction indicative of pregnancy, while 54, or 29.2 per cent, showed a positive reaction. It is interesting to note that among those giving a correct response

TABLE 1.—*Persons Tested*

Diagnosis	Number of Cases	Percentage of Cases
Antepartum	185	37.0
Nonpregnancy	315	63.0
Normal and nonendocrine	153	30.6
Girls	8	
Boys	12	
Women	93	
Men	40	
Endocrine disturbances	132	26.4
Girls	4	
Boys	8	
Women	110	
Men	10	
Postpartum	30	6.0

the period of gestation varied from nine to thirty-nine weeks with an average of twenty-seven and six-tenths weeks. On the other hand, those showing an incorrect response varied from four to thirty-nine weeks with an average of twenty and five-tenths weeks. The average period of gestation appears to be somewhat shorter among those showing the false reaction.

In the postpartum group of 30 tests there were 17 correct reactions, or 56.6 per cent, and 13 incorrect, or 43.4 per cent. Here the average period following delivery was slightly smaller for the group of correct reactions. The period post partum among this group varied from three to twenty-six weeks with an average of eight and five-tenths, while that among the incorrect group varied from five to twenty-two with an average of nine and three-tenths weeks. It appears that the test may be less accurate in the first six months following pregnancy than during the period of gestation.

In the control groups composed of nonpregnant, nonendocrine cases, the total number of tests performed was 153. Among these were 40 men showing the nonnegative reaction, an incidence of 75 per cent, 93 women showing a correct reaction in 65.6 per cent of cases, 8 girls with a correct incidence of 50 per cent and 12 boys with an incidence of 66.6 per cent. The total number of correct reactions among this group was 103, or 67.3 per cent. It is interesting to note that the percentage of correct responses among the normal males was distinctly higher than that of the females (73.1 per cent to 64.3 per cent). In the subjects classified as nonpregnant endocrine patients the total number of tests performed was 132, of which 89, or 67.4 per cent, were incorrect. Among these the women showed the

TABLE 2.—*Correct Reactions*

Diagnosis	Total Number	Number Correct	Percentage Correct
Antepartum	185	131	70.8
Postpartum	30	17	56.6
Control men	40	30	75.0
Control women	93	61	65.6
Control boys	12	8	66.6
Control girls	8	4	50.0
Endocrine men	10	8	80.0
Endocrine women	110	75	68.1
Endocrine boys	8	7	87.5
Endocrine girls	4	3	75.0
All women	418	280	66.9
All men	50	38	76.0
All children	32	22	68.7
Total tests	500	340	68.0

greatest error (35.5 per cent). The men showed only 20 per cent error, the girls 25 per cent and the boys only 12.5 per cent.

An analysis of the incidence of correct reactions among the various groups is found in table 2. It should also be noted that the expected reactions in the entire group of women and also among the pediatric cases were somewhat less than that in the total group of men; also that the apparent efficiency of the test based on the total average incidence of correct reactions is only 68 per cent.

Since women at the child bearing age or during the early stages of the menopause make up a large percentage of the cases which are diagnostic pregnancy problems, the efficiency of any pregnancy test would necessarily depend on the accuracy of the test in this group of patients. An analysis of the group in our series, comprising a total of 110 cases, shows a correct incidence of approximately that found in any other group. It was observed that in the cases of idiopathic

TABLE 3.—*Analysis of Endocrine Cases (Women)*

Diagnosis	Number Correct	Number Incorrect	Total Cases	Percentage Correct
Menopause	26	16	42	61.9
Amenorrhea	14	3	17	82.3
Hypothyroidism	12	1	13	92.3
Sterility	4	4	8	....
Menorrhagia	5	3	8	....
Obesity	3	2	5	....
Metrorrhagia	1	3	4	....
Senile vaginitis	1	2	3	....
Posthysterectomy	2	1	3	....
Dyspituitarism	2	0	2	....
Hypoadrenalism	1	1	2	....
Hyperplastic endometrium	1	0	1	....
Diabetes insipidus	1	0	1	....
Pituitary tumor	0	1	1	....
Total	75	35	110	68.1

sterility, which consisted of only eight tests, the efficiency if anything was lower than that of the entire series. The menopausal cases, which formed the greatest number in this group, are sufficiently important to justify separate analysis (table 4).

While the proportion of correct reactions in the entire group of menopausal cases was 61.9 per cent, it is

interesting to note that there was a higher degree of accuracy in those instances in which estrogen therapy had been instituted.

Of the group of cases in which endocrine therapy was administered in one form or another (62 in all) the accuracy remained approximately the same as that in all other groups. There appeared to be some greater percentage of expected reactions in the cases in which thyroid therapy alone was administered (table 5).

COMMENT

That there appears to be some basis for the specificity of cutaneous reactions to colostrum during pregnancy is somewhat substantiated by our series by the fact that about 70 per cent of all pregnancies showed no sensitivity, while about 70 per cent of all nonpregnancies showed a reaction of sensitivity. Nevertheless, we find it difficult to explain why our figures vary so widely from those reported by Fall and his co-workers. As suggested by these authors, the test might be explained on the basis of sensitivity to either some protein content of the colostrum or its endocrine constituents. In either case it would be difficult to explain why in 1 of our cases

TABLE 4.—*Menopausal Cases*

Diagnosis	No. of Cases	Number Correct	Percentage Correct
No therapy	18	10	55.5
Estrogen therapy	23	15	65.5
Gonadotropic therapy	1	1	100.0

TABLE 5.—*Cases in Which Endocrine Therapy Was Employed*

Therapy	No. of Cases	Number Correct	Percentage Correct
Estrogen alone	26	17	65.4
Thyroid alone	17	13	76.4
Gonadotropic substance alone	10	7	70.0
Thyroid and gonadotropic substance	3	2	....
Estrogen and thyroid	2	1	....
Estrogen and gonadotropic substance	2	2	....
Desoxycorticosterone acetate	2	1	....
Total	62	43	69.3

a normal pregnant woman showed definite sensitivity to her own colostrum and also to that of another patient. An analysis of our cases from the standpoint of protein sensitivity (based on the entire group, both male and female) and a similar analysis of only endocrine disturbances or patients subjected to endocrine therapy fail to reveal any appreciable difference in the incidence of reactions. Consequently it is difficult from our own experience to designate which of the two, if either, is the basis for the reaction.

While the earlier report showed negative reactions (pregnancy-like) in children before puberty, our series showed 66 per cent positive reactions (nonpregnant) in boys and 50 per cent in girls.

CONCLUSIONS

1. In 500 tests of cutaneous sensitivity to colostrum there were approximately 70 per cent correct reactions in all groups, both male and female, tested.

2. There was apparently no greater or less efficiency of the test among endocrine cases.

3. In our hands the colostrum cutaneous test does not appear to offer a valuable diagnostic procedure for pregnancy.

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Clinical Notes, Suggestions and New Instruments

ANISEIKONIA

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Recently in the popular pseudoscientific literature published for the general public there have appeared several articles on aniseikonia, with the result that patients have become more familiar with the term than has the average physician. This frequently leads to a misconception of the condition by the patients. I constantly receive inquiries from physicians who at the instigation of their patients wish to know something of this condition. To answer these questions I have written this paper.

THE NATURE OF ANISEIKONIA

Aniseikonia [1] is defined as a difference in the size and the shape of ocular images in the two eyes. It should be emphasized that the word ocular rather than retinal image is used. The image with which the measurement of aniseikonia is concerned is not the optical image which falls on the retina but rather is the image which arrives at the higher centers of vision and is then projected in space as the perceived object. In the process of the perception of this resultant image there are several factors: (1) the object seen, (2) the external medium for the light rays, (3) ordinary spectacles worn by the patient, (4) the ocular media, i. e. cornea, aqueous, lens and vitreous, (5) the refractive state of the eye (e. g. myopia or hyperopia), (6) the visual pathway and (7) the higher visual centers in the brain, involving projection and perception. Any of these factors may alter the size or the shape of the ocular image.

It has long been recognized that the two eyes of the same person do not see alike. If a person is far sighted in one eye and near sighted in the other, it can be assumed that the object he sees is larger through the convex lens for his far sighted eye than the object he sees through the concave lens of his near sighted eye. This is based on the fact that a biconvex lens magnifies, while a biconcave lens minifies. Cognizance of this difference in the imagery of the two eyes was taken as early as 1863 by Donders, but he and the investigators who followed him felt that nothing much could be done to correct the condition. While attempts at correcting differences in size between the images produced by the two eyes in monocular aphakia following surgical intervention for cataract was started from time to time, no great effort was made to correct the differences in the images produced by so-called normal eyes until the advent of Professor Ames and his work at the Dartmouth Eye Institute.

Following the lead of certain European writers, the group at Dartmouth began to investigate the optics of vision and gradually worked into the realm of binocular vision and space perception and the effect of aniseikonia on this mechanism. It quickly became apparent that the difference in size between the images in the two eyes was usually small—a matter of only a few per cent. Rarely are large differences noted.

At the Dartmouth Eye Institute a number of pieces of apparatus have been invented with which studies are carried on by

From the Department of Ophthalmology, Northwestern University Medical School.

1. Aniseikonia forms the subject matter of the following articles:
Lancaster, W. B.: Aniseikonia, Arch. Ophth. **20:** 907-912 (Dec.) 1938.
Hughes, W. L.: Clinical Observations on Aniseikonia, Am. J. Ophth. **18:** 715-718 (Aug.) 1935.
Hughes, W. L.: Aniseikonia with No Refractive Error, Arch. Ophth. **17:** 944 (May) 1937.
Carlton, E. H.: Clinical Aspects of Aniseikonia, Am. J. Ophth. **20:** 419 (April) 1937.
Wibaut, F.: Enstehung und Klinik der Refraktionsanomalien, Sehschärfe, Akkommodation, Ophthalmologica **97:** 317-325 (July) 1939.
Ames, A., Jr.: Aniseikonia: A Factor in the Functioning of Vision, Am. J. Ophth. **18:** 1014-1020 (Nov.) 1935.

the members of the institute on such matters as the effect of aniseikonia on the perception of flat surfaces and on space orientation. One of these instruments which has received a great deal of publicity is the "leaf room." This room is designed so that the observer sits at one end and sees three walls, the floor and the ceiling. The walls are covered with equal sized leaves, and no pictures or other objects are allowed to destroy their continuity. As the observer looks at the room, he will get certain distortions of its shape and size if he has an aniseikonic condition.

Another instrument, which has received equal publicity, is the tipping table. This is a flat table top mounted on a universal joint so that it may be tipped in any plane. The effect of aniseikonia on the perception of flat surfaces is one of tipping. As a person with aniseikonia looks at the table top he will find that it does not appear level when actually it is. He is asked to set the table level, and a measurement of the strength of the aniseikonic lens required to make the table appear level may be a measurement of his aniseikonia.

Other instruments, which have rather fancy names, have been devised during the investigation. These are the "squirrel cage," which gives the subject a three dimensional target to examine with aniseikonic lenses, and the S curve machine, which has been developed to study the "induced effect" of size lenses. A constantly changing host of instruments is being used at the institute, all with the idea of research in aniseikonia.

THE EIKONOMETER

There are two general methods of measuring differences in size of images produced by the two eyes: (1) the direct method, involving use of the eikonometer, and (2) the indirect method, in which functional tests are used to study tipping effects and distortions of the horopter. The latter method is difficult to use because of measurement factors and the extreme amount of careful judgment the patient must use.

The eikonometer (shown in the accompanying illustration) consists of an elaborate adjustable head and chin rest, together with six cells mounted in front of each eye. These cells contain the refractive lenses of the patient: two aniseikonic units, of which one varies in size over all meridians and the other in only one meridian. The remaining cell is used to hold an analyzing lens for a polaroid system.

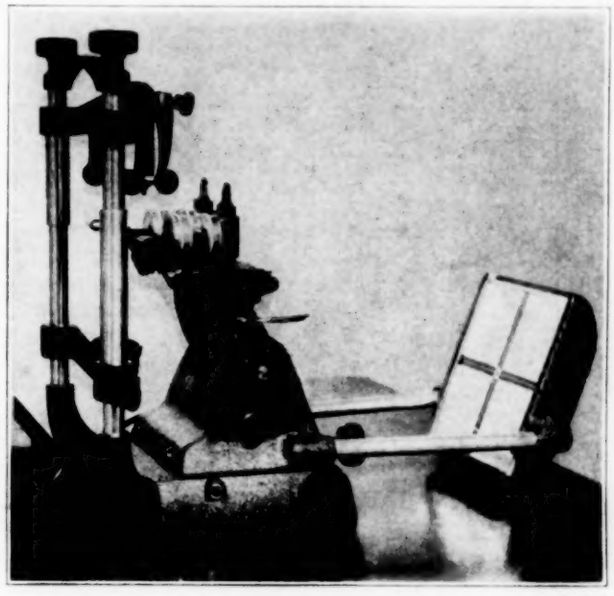
The target consists of a cross formed by two lines having on them equidistant from the intersection short lines numbered 1 to 8. It is arranged so that the odd numbers and their corresponding line are seen through the polaroid system with one eye and the even numbers are seen with the other eye. The patient describes the difference in level of these small lines. By means of the size lenses (eikonic units) the target is made to appear equal in the two eyes. Readings are taken at 15 feet, 20 feet and 16 inches. When one has arrived at a prescription, this is given as either temporary or permanent, and a lens is ground accordingly. Some of the lenses are thick; others are only a little different from ordinary spectacles except for the base curve of the lens.

There are no symptoms which can be definitely called aniseikonic. If the difference in size between the images in the two eyes is considerable, a suppression may take place. If the correction is slight the symptoms may be those of asthenopia, i. e. ocular fatigue, headaches with use of the eyes, lacrimation, and burning and itching of the eyes. Only rarely does a patient complain of tipping and distortion of objects, especially flat surfaces. Aniseikonic patients frequently complain of faulty space perception and inability to judge distance and the flight of a moving object. Ocular distress which cannot be relieved by the use of ordinary procedures in refraction and muscle balance and correction of fusion difficulties should cause one to think of aniseikonia as the fundamental defect.

THE CORRECTION OF ANISEIKONIA

After reading the articles in popular literature one is apt to get the mistaken conception that aniseikonia is a common defect. Actually, it is found that probably not more than 2 per cent of the general population have correctable aniseikonia. As persons are measured routinely with the eikonometer, it is found that the images in the two eyes in practically all of them will evidence some differences. Usually this is 0.25 to 0.50 per cent. Persons who have been measured because their symptoms were thought to have an aniseikonic origin were found to have on an average 1.50 per cent to 1.75 per cent difference in size of the images.

It is well to state here that not all patients shown to have aniseikonia are entirely relieved of symptoms by wearing the aniseikonic lenses. Roughly speaking, only about one third of the patients given the glasses will report that they are entirely relieved of their symptoms. Another third will report partial relief, and the last third will frankly report that their money has been wasted and that they have not been helped.



Eikonometer and target.

In the correction of aniseikonia three general ideas must be impressed on patients:

1. Binocular vision must exist in some form in order that tests and proper correction may be made.

2. This work is not a panacea for headaches and ocular distress.

3. Some persons respond in such a way to the action of aniseikonic lenses that it is necessary to use temporary prescriptions in the form of clip-on lenses to study the subjective response of the patient before a permanent lens is made. If this is not done possibly there will be a certain shift in the correction in a short time necessitating the outlay of considerable money.

The cost of spectacles containing aniseikonic lenses averages about $20 to $40, depending on the correction required and the type of glasses the patient desires.

It has been my experience in the department of ophthalmology of Northwestern University Medical School that the majority of patients who are referred for aniseikonic measurement are in need of (1) a more adequate refraction and (2) an investigation of binocular vision from the point of view of muscle balance, vergence powers and stereopsis. The vast majority of patients will be relieved of asthenopic symptoms if the needs mentioned are first properly attended to. After that has taken place, aniseikonia should be considered.

ARTERIOVENOUS FISTULA

KENNETH E. GAMM, M.D., GALVESTON, TEXAS
Passed Assistant Surgeon, United States Public Health Service

A careful search of the literature since Steinmann first described the use of his pin for skeletal traction in 1907 has failed to produce a report of an arteriovenous aneurysm resulting from its use. It seems amazing that some instances have not been reported when one considers the proximity of the anterior tibial artery and vein to the anterior tibial crest at its distal third. The use of the Steinmann pin for skeletal traction gained popularity in this country in 1918 following the war, and further impetus to this means of traction was added by the publishing of Böhler's fracture book in English in 1929. In the eastern part of the country traction for tibial fractures is usually obtained by a pin through the os calcis, while in our section of the country it seems to be the rule to place it through the distal end of the tibia and avoid traction through a joint.

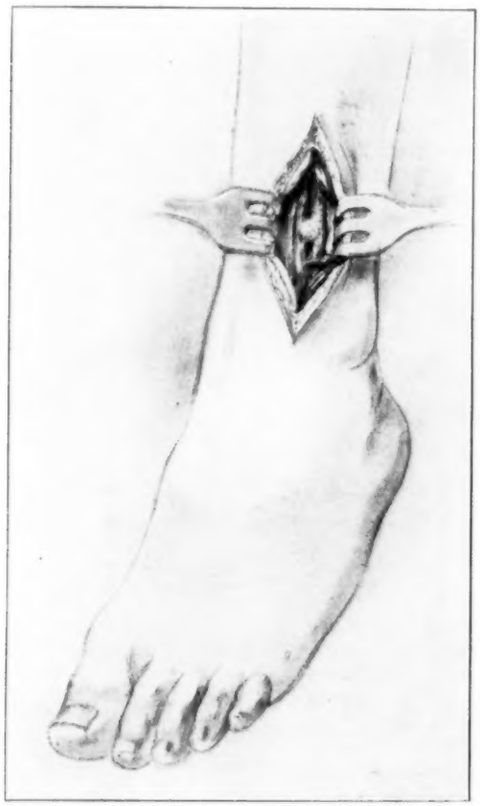


Fig. 1.—Relationship of arteriovenous fistula to ankle.

A brief list of references to the literature is given[1] for those wishing to refresh their memory with the pathologic physiology of abnormal communications between the arteries and veins in the extremities.

REPORT OF CASE

R. W., aged 44, an American seaman, on April 2, 1941 fell 12 feet down a ladder aboard his ship and sustained a fracture of the left os calcis.

For a number of years the patient has consumed about 300 cc. of alcohol daily. He had a gunshot wound of the left hand and a bayonet stab wound of the left arm in 1918. The rest of his past history is noncontributory.

The fracture was treated in a Böhler reducing frame by means of traction with a Steinmann pin through the os calcis and countertraction through the distal third of the tibia. He was placed in a cast which encompassed the pins. This was removed at the end of six weeks. The patient alleges that there was a considerable amount of bleeding from the pin wounds in the tibia when the pin was removed. The patient returned to work in July and except for an occasional pain he had little swelling in the left ankle and foot. On August 2 he twisted his ankle, and because the pain and swelling persisted he presented himself at our hospital for treatment. Examination in the outpatient clinic of the injured ankle revealed a palpable thrill and a bruit audible with the stethoscope. He was promptly hospitalized for further study.

Physical examination revealed that the patient was well nourished and well developed. He walked with a limp and favored the left ankle.

Examination of the head, eyes, ears, nose and throat was noncontributory except for pyorrhea alveolaris.

The chest was asthenic with retracted clavicular spaces. Respiration was free and at the rate of 18 a minute. The lungs were essentially normal on percussion and auscultation.

The heart was not enlarged to percussion, and a teleroentgenogram revealed no increase in size. There were no murmurs and the rhythm was regular. The blood pressure was 160 systolic and 94 diastolic. The pulse was full and rapid, 118 a minute.

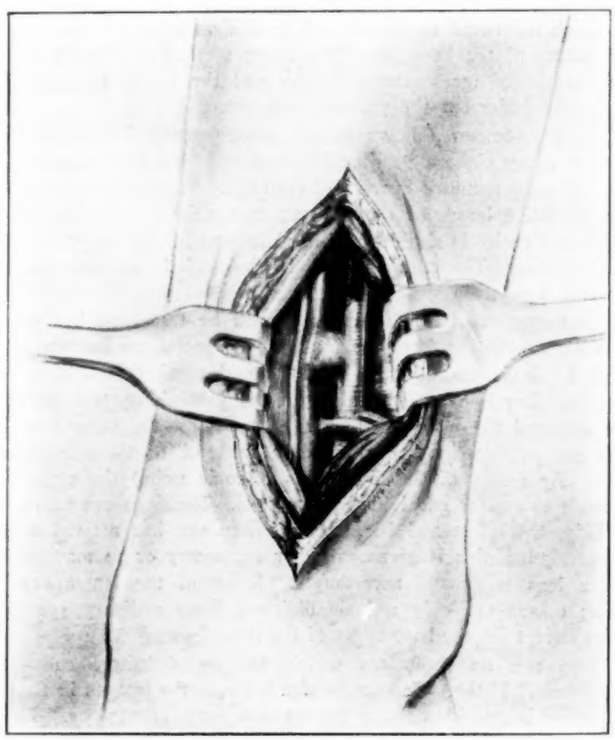


Fig. 2.—Arteriovenous aneurysm at operation.

The abdomen was essentially normal, as was the genitourinary system.

Examination of the extremities was noncontributory except for the left lower leg. There was moderate edema about the left ankle extending over the dorsum of the foot. He had a complete range of motion in the left ankle but alleged pain on all motion. Inversion and eversion particularly caused pain in the subastragalar joint. There was some widening of the os calcis with a piling up of bone beneath the fibula. There

From the U. S. Marine Hospital.

1. These include:

Stewart, F. T.: Arteriovenous Aneurysm Treated by Angiorrhaphy, Ann. Surg. **57**: 574-581, 1913.

Matas, Rudolph: Arteriovenous Fistula of the Femoral Vessels (Aneurysmal Varix on a Level with the Origin of the Profunda: Details of Technic and Commentaries), S. Clin. North America **2**: 1165 (Oct.) 1922.

Reid, Mont: The Treatment of Abnormal Arteriovenous Communications, Arch. Surg. **11**: 237 (Aug.) 1925.

Herman, L. G., and Reid, Mont.: The Management of Arteriovenous Aneurysm in the Extremities, Am. J. Surg. **44**: 17-24 (April) 1939.

Pemberton, J. DeJ., and Waugh, J. M.: Traumatic Arteriovenous Aneurysm, S. Clin. North America **19**: 981 (Aug.) 1939.

Murray, Gordon: Heparin in Thrombosis and Blood Vessel Surgery, Surg., Gynec. & Obst. **72**: 340-344 (Feb.) 1941.

was a palpable thrill along the anterior tibial region lateral to the crest 8 cm. above the ankle joint, with systolic accentuation. Over this area a systolic accentuated bruit was audible throughout the cardiac cycle. The foot was warm and moist. The dorsalis pedis artery and the posterior tibial artery were pulsating.

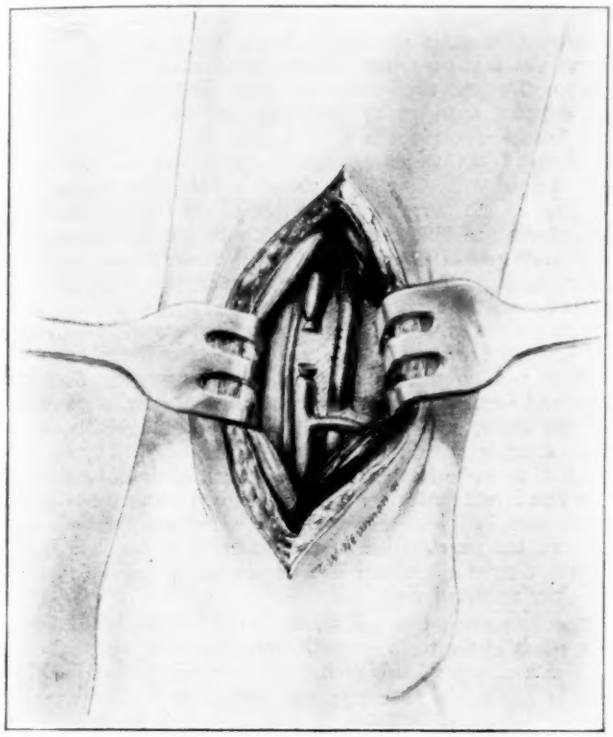


Fig. 3.—Vein ligated with arteriorrhaphy completed.

On compression of the pulsile mass or compression of the anterior tibial artery above, the thrill and bruit disappeared. A modified Branham's bradycardia phenomenon was present. After the fistula was occluded the pulse dropped from 108 to 92, but the blood pressure failed to rise and there was no feeling of faintness or thoracic constriction.

Oscillometric and dermatherm readings with a U. M. A. oscillometer of the Collen's type are given in the accompanying table.

A Moschcowitz-Matas test revealed adequate circulation to the left foot.

Usually it is best to wait six months before having the operation after injury, but once the patient was aware of the aneurysm he was anxious to have it corrected.

Arteriograms were made with colloidal thorium dioxide but were not conclusive.

After a twenty-four hour preparation of the skin with soap packs on August 15, the anterior tibial region was exposed. The tibialis anticus muscle was retracted medially and the extensor hallucis longus and deep peroneal nerve were retracted laterally. Thus was exposed a fistulous communication of fibrous tissue that appeared to be neither vein nor artery between the left anterior tibial artery and vein. Its lumen was about 0.5 cm. in diameter and its outside diameter 1 cm. There was a large amount of scar tissue about the artery and vein, but the wall of the artery did not appear thinned out nor did the proximal branch appear dilated. The wall of the vein was somewhat thickened but not dilated. Photographs taken were not sufficiently detailed to publish, but the semidiagrammatic drawing shows the involved area before and after repair. The fistulous tract was excised and the proximal and distal segments of the tibial vein were ligated. The anterior tibial artery was clamped with a Dieffenbach clamp and the fistulous communication was closed with five sutures of 0000 arterial silk. When the arterial clamp was removed, the dorsalis pedis artery was again seen to pulsate, and the arteriorrhaphy was competent.

On microscopic examination the tissue consisted of a vessel wall irregularly and definitely thickened. It was composed of an irregular, dense meshwork of cellular fibrous tissue with ovoid and elongated nuclei. Some were considerably flattened and elongated. There was no definite pattern of arrangement. This wall faded imperceptibly into a denser, less cellular surrounding stroma containing scarred adipose tissue and collagenous fibers. The outer surface of the specimen was covered with adipose tissue infiltrated with a few neutrophils, probably of operative origin. The vessel was lined with intima of varying thickness and not well demarcated. A few neutrophils were noted just exterior to the endothelium. A few arterioles coursing through the specimen had significantly hyperplastic walls and small lumens.

The patient was given a solution of heparin immediately and continuously in sufficient amount to keep his clotting time above fifteen minutes. This required 40,000 units a day; 10,000 units was given in 500 cc. of physiologic solution of sodium chloride, about 15 drops a minute by means of an 18 gage needle in the basilic vein. Owing to the oozing from the anterior tibial wound, the heparin was discontinued after forty-eight hours, although we had planned on giving it for seven days.

The convalescent course was not without excitement, for the patient left the hospital against advice on the fourth postoperative day. He was returned to us by the police on the twelfth postoperative day. He was in the midst of an alcoholic debauch, and his operative wound had become infected. He has been seen in the outpatient clinic since that time but never will remain long enough to permit us to do a skin graft on the granulating anterior tibial wound. When seen in November 1941, the anterior tibial artery was palpable and all the patient's complaints were referable to his postoperative wound.

COMMENT

This case was of particular interest owing to the fact that an arteriovenous fistula, even as small as this one proved to be, can produce mild cardiac embarrassment. Usually, unless local symptoms are present, small arteriovenous fistulas of the extremities do not warrant operative repair and may, within a year after the injury, heal spontaneously.

Oscillometric and Dermatherm Readings

Oscillometric Readings	Right	Left
Midthigh	8	12
Above knee	9	14
Below knee	8	16
Calf	6	20+
Ankle	6	17
Foot	1	2
Dermatherm Readings		
Great toe	88°	80°
Instep	87¼°	89¼°
Dorsum foot	89°	91°
Inside foot	88°	89°
Anterior ankle	90°	92°

The accepted treatment for fistulas of the anterior tibial artery and vein has been to excise the aneurysm and ligate the proximal and distal arteries and veins with all collateral communications. However, in view of the success that Murray of Toronto has had in vascular surgery since using heparin, we yielded to temptation and did a ligation of a vein with lateral arteriorrhaphy. We were fortunate in preserving the pulsation in the dorsalis pedis artery; this, we believe, justified our procedure.

Forty-Fifth Street and Avenue N.

THROMBOSIS AS A COMPLICATION OF VENOGRAPHY

JOHN HOMANS, M.D., BOSTON

The recent introduction of venography in a number of the larger clinics suggests that the procedure may perhaps become widely used. In that case the complications to which it may give rise should be made a matter of general knowledge. With this object in view, I report an instance of severe pain and local thrombosis resulting from the introduction of a 50 per cent compound diodrast solution into the lesser saphenous vein of the leg. Records of a previous case of this kind are not available to me.

REPORT OF CASE

A man aged 34 had previously been well and was of a vigorous, athletic type. However, his father had died of pulmonary embolism, and a brother had suffered a serious postoperative embolic accident from which he recovered. During the previous year the patient had experienced three attacks of acute pleuritic pain, each of which was followed after a few days by the expectoration of a moderate amount of blood. The severity of the attacks varied, and the attacks themselves were not particularly characteristic of pulmonary infarction. However, roentgenologic study of the chest on several occasions revealed what appeared to be pulmonary infarcts, several in the base of the right lung and one in the left. During this period the patient had not considered himself ill and had noticed no lameness, swelling or cyanosis in either leg, and had it not been for his family history he might perhaps have waited considerably longer before submitting to any sort of investigation. A bronchoscopic study of the lungs and the injection of iodized oil failed to reveal any pathologic condition in the air passages. Physical examination showed no abnormalities except that forced dorsiflexion of the right foot excited a very slight discomfort high up in the back of the calf—a positive "dorsiflexion sign" which was thought to mean that thrombosis had recently occurred in some of the great venous plexuses among the large flat muscles of the calf. To support this diagnosis it was thought advisable to make a venogram.

On Nov. 13, 1941 the right lesser saphenous vein, posterior to the external malleolus, was exposed in the usual way and a small blunt-nosed cannula tied into the vein with silk. As the patient lay on his face, 20 cc. of a 50 per cent compound diodrast solution was injected over a period of twenty seconds, that is at the rate of about 1 cc. a second, after which 20 cc. of salt solution was injected through the same cannula. Within a minute after the injection the patient experienced a violent cramp in the lower leg, which was so severe as to cause him to writhe. It lasted for about three to five minutes, dying out rather gradually, and was believed to be due to vascular spasm.

Late in the night and in the early hours of the next morning (the venogram was made about 4 p. m.) the patient experienced an aching discomfort in the right calf and was conscious of a tightening and swelling of the right leg. In the morning it was clear that a fresh, extensive thrombosis had occurred in the deep veins of this leg. The calf had increased perhaps 2 cm. in circumference, as compared with the other leg. The foot was bluish, and the muscles felt tense and resistant. The reaction was confined to the lower leg, but a hardening along the great saphenous vein was evident, at this time entirely below the knee. Here it is pertinent to remark that the venogram gave no evidence of occlusion of the veins but did show slight irregularity in the lower part of the femoral vein as if a nonoccluding thrombus had previously been organized and had left several small irregularities in the wall of the vein. Thus the right leg was presumably the source of embolism. A venogram of the left leg for purposes of comparison was not attempted.

Because of the unexpected thrombosis, the recent pulmonary infarctions and the patient's family history it seemed advisable to divide the femoral vein at the groin in order to head off a further spread of the thrombosis and possible detachment of an embolus. The operation was performed with local anesthesia without any particular difficulty, and no thrombus was found in the superficial femoral vein just below the profunda. Here the vein was divided. On examination of the thigh at the end of the operation it was realized that the thrombosis in the saphenous vein had progressed upward so rapidly that it had reached a point within 2 to 3 cm. of the saphenous opening. Accordingly the great saphenous vein as well was sectioned.

The patient's tendency to thrombosis appeared to have been so actively stimulated that it was decided to heparinize him. Accordingly heparin was given during the next five days by injection at four hour intervals, and the clotting time was kept between five and twenty-five minutes. The foot of the bed was elevated 6 inches to encourage an easy venous return. The patient was given a normal diet with plenty of fluids. At the end of five days, on the withdrawal of heparin, a fresh accession of thrombosis began. This showed itself in the form of a recurrence of swelling of the calf, tenseness of the muscles and blueness of the foot. It was associated with a moderate rise of temperature, but the whole process subsided fairly rapidly, and within two weeks after the operation the leg had regained a normal appearance. The patient was then able to get out of bed wearing an elastic stocking. He gradually increased his periods of activity, which brought on no swelling and no more than a moderate engorgement of the ankle and foot. However, twenty-seven days after venography the extraction, with procaine hydrochloride anesthesia, of a suppurating, impacted third molar tooth was followed by another attack of thrombosis, this time in a branch of the lesser saphenous vein directly tributary to the vessel into which the injection of diodrast had been made. There were heat, redness and soreness, but on elevation of the extremity in bed this whole process cleared up within five or six days, and the patient has since remained well.

It seems possible that a dissemination of bacteria had occurred as a result of the tooth extraction and that this caused thrombosis in a vein previously irritated by the injection of diodrast.

It is impossible to escape the conclusion that it was the introduction of the solution of diodrast which touched off, in veins which had recently been the scene of phlebothrombosis, the patient's violent, acute attack. The immediate painful effect, followed within eight or ten hours by the active thrombosis itself, indicates clearly enough what happened. However, there is present in this case what might be called a thrombophilic background. There appears to be even a constitutional tendency in the patient and his family to thrombosis and embolism. This has shown itself in other members after operation, but in this patient embolism occurred without clinical signs of thrombosis and in the absence of any injury or operation whatever. The suggestion is offered, in view of the recurrence following extraction of the infected tooth, that a focal infection in some way may have influenced the thrombosing process.

The rare serious general reactions to the introduction of iodine solution are apparently at present unpredictable. Death has been known to occur in the making of a venogram with diodrast. In the case presented there was no question of any constitutional reaction, for no change in the circulatory or the nervous system occurred and urticaria or edema did not follow the introduction of the solution. It must therefore be supposed that in a person susceptible to thrombosis the introduction of a 50 per cent compound diodrast solution into the lesser saphenous vein caused immediate vasoconstriction followed by thrombosis, that a local venous disorder continued for at least five days (because a recurrence followed the withdrawal of heparin) and that even twenty-seven days after the original injection of diodrast the tendency to thrombosis was still present (because there was recurrence in the vein into which the injection had been made).

Diodrast, as a 35 per cent, 50 per cent and even stronger solution, is commonly introduced into the veins. It has frequently been introduced into a vein of the foot in the presence of active thrombosis without exciting any detectable reaction. The procedure is so valuable that one unfortunate but not serious accident should not be held against it. A watch should be kept for similar episodes, with an eye to their prevention.

311 Beacon Street.

Council on Pharmacy and Chemistry

REPORT OF THE COUNCIL

IN 1932 THE COUNCIL ON PHARMACY AND CHEMISTRY SET UP A SPECIAL COMMITTEE ON THE STANDARDIZATION OF CATGUT TO DETERMINE THE STATUS OF THE STERILITY OF COMMERCIAL CATGUT SUTURES AND AT THE COUNCIL'S REQUEST THE BOARD OF TRUSTEES OF THE AMERICAN MEDICAL ASSOCIATION GRANTED THE COUNCIL AN APPROPRIATION FOR A SPECIAL INVESTIGATION OF THIS PROBLEM. AS A RESULT OF THIS ACTION A REPORT ON THE SUBJECT, PREPARED FOR THE COMMITTEE BY AN OUTSIDE INVESTIGATOR, WAS PUBLISHED UNDER THE AUSPICES OF THE COUNCIL (BREWER, JOHN H.: THE PRESENT STATUS OF THE STERILITY OF CATGUT SUTURES ON THE AMERICAN MARKET, J. A. M. A. **108:** *722* [FEB. *27*] 1937).

ON THE RECOMMENDATION OF THE COUNCIL'S COMMITTEE ON THE STANDARDIZATION OF CATGUT THE INVESTIGATION OF A DIFFERENT PHASE OF THE PROBLEM OF THE STANDARDIZATION OF SURGICAL CATGUT HAS BEEN AIDED IN PART BY ANOTHER APPROPRIATION GRANTED RECENTLY BY THE BOARD OF TRUSTEES: UNDER THE AUSPICES OF THE COUNCIL A STUDY OF THE ABSORPTION QUALITIES OF SURGICAL GUT WAS INITIATED AND CARRIED OUT BY DR. HILGER PERRY JENKINS AND CO-WORKERS AT THE UNIVERSITY OF CHICAGO, DEPARTMENT OF SURGERY. THE PAPER WHICH HAS BEEN PREPARED BY THESE INVESTIGATORS IS IN FOUR PARTS AND, BECAUSE OF ITS UNUSUAL LENGTH, IS BEING PUBLISHED IN THE ARCHIVES OF SURGERY IN FOUR CONSECUTIVE INSTALMENTS, THE FIRST OF WHICH APPEARS IN THE MAY ISSUE OF THAT PUBLICATION.

IN RECOGNITION OF THE CONTRIBUTION OF THESE INVESTIGATORS ON THIS PHASE OF CATGUT SUTURE STANDARDIZATION AND BECAUSE OF THE IMPORTANCE OF THE INFORMATION TO THE MEDICAL PROFESSION, THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING SYNOPOSIS OF THIS STUDY IN THE FORM OF A REPORT. THE COUNCIL DESIRES TO EXPRESS APPRECIATION TO THE AUTHORS OF THE PAPER AND TO THE COMMITTEE ON THE STANDARDIZATION OF CATGUT, PARTICULARLY TO THE CHAIRMAN FOR HIS EFFORTS IN REVIEWING THE PAPER.

ON THE BASIS OF THE DATA CONTAINED IN THE PAPER BEING PUBLISHED IN THE ARCHIVES OF SURGERY, THE COUNCIL BELIEVES THE PRESENT LABELING OF SURGICAL CATGUT ON THE MARKET—PARTICULARLY WITH RESPECT TO THE LENGTH OF TIME THE CATGUT CAN BE EXPECTED TO PERFORM ITS FUNCTION IN THE TISSUES UNDER CONDITIONS OF ACTUAL USE—IS INADEQUATE AND THAT BETTER METHODS OF GRADING THE VARIOUS TYPES OF THIS SUTURE MATERIAL ARE NECESSARY AS RECOMMENDED IN THE PRESENT STUDY.

AUSTIN E. SMITH, M.D., Acting Secretary.

ABSORPTION OF SURGICAL GUT (CATGUT)

The results of a recent comprehensive study by Dr. H. P. Jenkins and his associates on this subject are being published elsewhere.[1] The observations made by these investigators are reported herewith under headings which represent the subtitles used by the authors to designate the four parts into which their paper is divided.

I. THE DECLINE IN TENSILE STRENGTH IN THE TISSUES

This part of the study begins by the investigators pointing out that the term "catgut" as commonly applied to surgical sutures is essentially a misnomer and that the term "surgical gut" which has been adopted by the U. S. Pharmacopeia to designate sheep intestine prepared for surgical use is a fundamental improvement in suture terminology. It is indicated that the absorbability of this material has been the subject of some controversy: from previously published observations, the duration of the tensile strength of catgut in the tissues did not correspond closely to the label declaration of this material as so-called twenty day chromic or forty day chromic—terms which have been used to designate the "approximate" absorption time.

To obtain further data concerning the problem, the investigators carried out a series of fifteen hundred implants (usually made in duplicate) of 6 inch lengths of surgical gut in the abdominal muscles of dogs to test various types and sizes of this suture material as marketed by ten different manufacturers: so-called plain catgut and twenty day (medium hard) chromic and forty day (extra hard) chromic catgut, in all sizes from No. 2 to No. 000, of six concerns and twenty day (medium hard) chromic catgut in sizes No. 2, No. 0 and No. 000 of four concerns were used in the study. Most of the catgut tested was manufactured prior to the change in labeling recommended by the Committee of Revision of the U. S. Pharmacopeia, which has adopted the following nomenclature for the various types of surgical gut:

Type A. Plain Surgical Gut (untreated).
Type B. Mild Chromic (mild treatment).
Type C. Medium Chromic (medium treatment).
Type D. Extra Chromic (prolonged treatment).

These official designations are the approximate equivalents of plain, ten day chromic, twenty day chromic and forty day chromic catgut respectively. The remaining portions of each strand of surgical gut used in the implants were saved for a determination of its original tensile strength by means of a spring scale and for subsequent digestion tests in enzyme solutions. The animals were killed at the end of various periods, depending on the type of catgut which had been implanted, and the residual tensile strength of the specimens thus recovered was measured to afford comparison between the different brands studied. These observations were plotted on graphs in terms of the days of the duration of tensile strength of the gut from averages obtained from six or more individual tests on each size, type and brand of gut. In those tests in which there was appreciable residual tensile strength of the implanted gut at the termination of the test implantation period, this residual strength was measured. With the data on original tensile strength, the residual tensile strength and the duration of the gut in the tissues, a theoretical end point was computed by graph or equation. The theoretical end point was construed as the time at which "useful holding power of the suture was gone." The graph or equation method was based on the assumption that the decline in tensile strength of surgical gut (catgut) in the tissues was a relatively constant factor, at least within reasonable limitations. This assumption was supported by observations made during the course of this work, as well as by other investigators. When implant specimens were recovered from the animal in short fragments with obvious loss of continuity, it was considered that the end point of complete loss of tensile strength had been reached. As pointed out in the latter part of this work, the loss of tensile strength of the gut was not necessarily shortly followed by complete disappearance of the gut from the tissues, especially when the gut remained intact for ten days or more in the tissues.

To test the reliability of the tests conducted on dogs as an index of the behavior of catgut in human tissues, the results obtained in the series of dog implants were graphically compared with clinical tests made in the laparotomy wounds of patients previously reported by the investigators. The series of graphs used to tabulate the various observations which were made in the study appear in the original paper.

The results obtained indicate that plain catgut of most manufacturers usually underwent a complete loss of tensile strength within approximately five days, whereas the various brands of chromic (treated) catgut showed considerable variation in performance. The differences between the duration of the tensile strength of twenty day and forty day chromic catgut of the same brand were relatively slight. The behavior of the twenty and forty day chromic catgut (without regard to size) of the different manufacturers was classified into three general categories: (1) those which did not maintain their tensile strength for ten days, (2) those which lasted ten to fifteen days and (3) those which held up for fifteen to thirty days. The various sizes for the same type of chromic material were frequently found to perform within different categories. The smaller sizes of chromic gut of several concerns outlasted the larger sizes rather conspicuously, although in other products the larger sizes held up better than the smaller sizes. A uniform loss of tensile strength of large and small sizes was rather uncommon. Attention has been drawn by other investigators to the longer duration of the smaller sizes of chromic gut in the tissues when certain products are used. The plain catgut was inclined to last about one day longer in patients than in dogs, whereas the chromic tended to hold a few days less in patients than in the animals.

On the basis of their results, the investigators point out that the terms "twenty day" or "forty day" which have been used for chromic catgut are to a considerable extent unreliable as far as duration of tensile strength in the tissue is concerned and

1. Jenkins, H. P., and Hrdina, L. S.: Absorption of Surgical Gut (Catgut): I. The Decline in Tensile Strength in the Tissues, Arch. Surg. **44:** 881 (May) 1942; II. Pepsin Digestion Tests for the Evaluation of the Duration of Tensile Strength of Surgical Gut in the Tissues, ibid., June 1942. Jenkins, H. P.; Hrdina, L. S.; Swisher, F. M., and Owens, F. W.: III. The Duration of Surgical Gut in the Tissues After Loss of Tensile Strength, ibid., July 1942. Jenkins, H. P.: IV. Recommendations for the Absorbability and Digestibility Specifications of Surgical Gut, ibid., August 1942.

that the Committee of Revision of the U. S. Pharmacopeia has taken a justifiable step in the elimination of such terms from the nomenclature of this suture material. From the tests made, the so-called twenty day chromic material (which is ordinarily used in suturing fascia) could not be expected to maintain its tensile strength for anywhere near that period, and the question was raised as to what should be the duration requirement of such material used in the ordinary case by the average surgeon. The reason for the failure of chromic catgut to maintain its holding power for the designated period, particularly in the larger sizes, is explained by the likelihood that manufacturers from experience had found it necessary to decrease the amount of chromic treatment sufficiently to avoid late absorption, which usually is the cause of a draining sinus from a knotted portion of the unabsorbed suture. Certain differences in plain catgut of the various brands tested are explained by probable differences in the source and method of preparation of the raw product obtained from sheep intestine. It is indicated that this might also account for variations in the chromicized sutures, since most manufacturers employ methods of treatment which are designed to give a fair amount of precision, although making allowances in the chromic treatment of the larger sizes. The slight difference in the behavior of the material in human beings and in dogs is explained on the basis of the differences in tension of the implanted sutures and in the method of implantation.

The investigators conclude that the implantation technic is a satisfactory direct method of evaluating the absorption qualities of surgical gut (catgut) from the standpoint of the rate of decline of its tensile strength in the tissues, that the nomenclature formerly employed to designate the absorption period of commercial products is sufficiently unrelated to the duration of their tensile strength to warrant its discontinuance, and that a period of about ten to fifteen days is probably better suited to the needs of the average surgeon for routine closure of fascia, particularly when large sizes of chromic suture material are used.

II. PEPSIN DIGESTION TESTS FOR THE EVALUATION OF THE DURATION OF TENSILE STRENGTH OF SURGICAL GUT IN THE TISSUES

This part of the investigation deals with in vitro digestion tests of catgut sutures and the relation of the digestion time in pepsin to the duration of the tensile strength in the tissues as reported in part I. It is pointed out that, although trypsin has probably been most generally employed as the enzyme for such tests, pepsin was used to explore the possibilities of this enzyme as a satisfactory basis for evaluating the absorption qualities of surgical gut. In one group of tests, digestion time was measured by a previously described ingenious method devised by Kraissl and Meleney (for trypsin digestion), so that, when strands of suture material held under tension by means of 30 Gm. lead weights were severed as a result of exposure to an acid pepsin solution in a special incubator, the circuit activating an electric clock was broken to permit determination of the elapsed period of exposure. At first the gastric juice obtained from dogs was used for the testing and then, after experimentation to ascertain the concentrations of pepsin and hydrochloric acid that most nearly approximated the results obtained with pure gastric juice, an aqueous solution of pepsin U. S. P. 10% (w/v) and hydrochloric acid U. S. P. 1% (v/v) was used. In another group of tests a simpler method of measuring digestion time was devised by affixing 2 Gm. split lead shots to sutures suspended in a graduated cylinder containing the same solution, so that the shrinkage, subsequent stretching and eventual breaking of the catgut could be detected by changes in the level assumed on the scale by the attached weights. The end point of breakage was conveniently detected by the noise made from the impact of the weight on the bottom of the cylinder or by estimating the time at which this would occur from the amount of stretching last detected. This procedure permitted a large number of observations to be made in an ordinary laboratory incubator. The temperature of incubation in both methods of testing was 37 C. and, in all, over three thousand two hundred tests were made. Essentially the same surgical gut which was used in the tissue implants was used for the digestion experiments. The shrinkage phase of the catgut in the solution was attributed to the acid, because it occurred in a hydrochloric acid solution of the same concentration without pepsin. Heat sterilized catgut was found to undergo more shrinkage than raw catgut not subjected to heat sterilization. The rate and extent of initial shrinkage were found to bear a relationship to the length of time for digestion: if rapid and considerable shrinkage occurred, the digestion time was shorter than when shrinkage was slow and less extensive. Breakage normally occurred during the period of stretching. If the break occurred before the stretching phase, it was considered a premature break, which was often due to a small area in the gut more vulnerable to digestion than the rest of the strand. Plain catgut and some of the large sizes of chromic catgut, when securely tied to lead weights, were found to undergo spontaneous untying while exposed to the action of the acid pepsin, whereas similarly exposed small sizes of the more resistant chromic catgut usually did not. This observation is of obvious significance to the surgeon who uses surgical gut for gastrointestinal anastomosis where the inner suture is bathed in gastric juice.

The 2 Gm. procedure of testing revealed that plain catgut of all brands tested was digested in an average of eleven hours; the larger sizes showed a general tendency to resist digestion longer than the smaller sizes. On the other hand, the average time for digestion of chromic catgut varied widely with different brands: most of the products tested averaged more than twenty hours, though some were almost the same as that observed generally for the plain material. Differences between the twenty day and forty day chromic sutures of the same brand and size were relatively minor. The smaller sizes of chromic gut of several companies outlasted the larger sizes by a conspicuous margin, although in other products the opposite was observed. These observations coincided with the results obtained by implantation of the gut in the tissues.

The 30 Gm. tests showed that plain catgut was digested in twenty-five to fifty hours and chromic catgut in fifty to one hundred and twenty-five hours. The longer digestion time by this method as compared to the 2 Gm. method was attributed to the greater degree of tension produced with the 30 Gm. procedure, a factor in the delay of penetration of the peptic ferment. It was found that results from the 30 Gm. and 2 Gm. tests had an approximate relationship of 2½ to 1 on the basis that twenty-five hours' exposure by the former was the equivalent of ten hours' exposure by the latter. By either test procedure, raw plain catgut (not heat sterilized) was found to have a rather wide range in digestion time depending on the source of the material, and chromicized catgut (not heat sterilized) was found to have a longer digestion time than that usually observed for the heat sterilized product of the same concern. All the observations from the two procedures were plotted on graphs which will accompany the original paper.

A correlation of the 2 Gm. digestion experiments and the previously accumulated observations on the duration of tensile strength in the tissues was done by using the combined averages from six of the ten brands studied for plain catgut and by using the separate averages obtained from each of the six brands of chromic catgut. These averages (plotted on a graph) showed an essentially straight line relationship, indicating that ten hours in digestion time should be considered the approximate equivalent of five days of duration of tensile strength in the tissues. It was shown that there was a corresponding trend in the general behavior of catgut in pepsin and in the tissues if allowances were made for variations in size and the brand of material studied, so that a reasonably accurate prediction of the tensile strength could be made on the basis of the digestion tests. The discrepancies of appreciable magnitude in the correlation are explained from the standpoint of a number of factors, such as management of the raw product, duration and temperature of sterilization, chemical agents in the tubing fluid and obscure details in the method of chromic treatment employed. Without possession of every detail involved in the preparation of surgical gut, it is indicated that the reliability of digestion tests in vitro to ascertain the expected duration of the tensile strength of the material in the tissues would be questionable. The influence of some factors on the results of digestion tests is discussed, particularly the variability of the original raw product.

In the evaluation of the reliability of the digestion test as an assay of the absorption qualities of surgical gut, the investigators point out that the enzyme preparation should be uniform (the one used in their study was obtained from the same source), its rate of deterioration during use must be taken into account (relatively high concentrations appeared to minimize attenuation of the enzyme) and the growth of bacteria in the solution must be prevented (the acid in the acid pepsin solution used gave adequate bacteriostasis). Other sources of error, such as too much tension and variation in the quality of different portions of the same strand of catgut, are also mentioned. The 2 Gm. suspension pepsin digestion test is suggested as a means of evaluating raw catgut; with such a method correlation may be established between unsterilized and heat sterilized chromic catgut which might serve as a basis for determination of the absorption qualities of this material before it is tubed, labeled and heat sterilized. Trypsin digestion of catgut which has not been heat sterilized proceeds too slowly to offer a feasible method for testing surgical gut before it reaches the stage of the sterilized finished product. The investigators propose the use of a common source of pepsin for testing the surgical gut marketed by several manufacturers in order to establish a basic unit for the tensile strength of the products in the tissues.

The investigators conclude that within certain limitations the 2 Gm. suspension pepsin digestion test described in their paper offers a simple, rapid, indirect method of evaluating the absorption qualities of surgical gut of most manufacturers, that discrepancies in the reliability of digestion tests on some products will probably not be understood fully without more information regarding their manufacture than is now generally available to investigators and that any such method of assaying catgut should be checked at intervals by clinical and experimental tissue implants to avoid misleading interpretations of the absorption quality of surgical gut on the market.

III. THE DURATION OF SURGICAL GUT IN THE TISSUES AFTER LOSS OF TENSILE STRENGTH

The importance of this aspect of the absorption of catgut in relation to the problems of delayed healing and early disruption of surgical wounds is pointed out in connection with references to previously published reports on the subject. The investigators endeavored to obtain a comprehensive view of the ultimate fate of surgical gut after loss of tensile strength from a series of approximately two thousand experimental implants in the abdominal muscles of dogs and from thirty-five clinical specimens obtained from patients at autopsy or secondary operation. Specimens of the animal tissue implants were obtained by killing the dogs after various periods of survival. Both the experimental and the clinical specimens were first examined grossly and then sectioned for microscopic study. Essentially the same products of the ten manufacturers which were studied in parts I and II were employed for this study, the sizes of catgut ranging from No. 2 to No. 000. Most of the catgut used was of the nonboilable variety, though a considerable number of samples of the boilable type were compared to the former. The gross and microscopic appearance of the specimens of tissue and of the various types, sizes and brands of catgut was recorded by means of photographs which will appear in the original paper.

The results obtained indicate a number of variable aspects in the absorption of surgical gut: the variation between different brands was generally of greater magnitude than that which occurred between the types or sizes of catgut of any one brand or between any particular lot of the same brand. The absorption behavior of the catgut could generally be classified from the gross appearance as "rapidly absorbed" or "slowly absorbed" and occasionally as "intermediately absorbed." Catgut which was previously found to have usually lost its tensile strength in less than ten days was generally "rapidly absorbed" within one to three weeks, that which usually retained its tensile strength beyond ten days was generally "slowly absorbed" within three to six months and that which occasionally remained intact for approximately ten days was frequently "intermediately absorbed" within three weeks to three months. The absorption behavior of catgut sutures could also be correlated, from the standpoint of the microscopic studies, with the cellular response of the tissues.

The response to catgut was characterized by two phases of reaction: an initial reaction consisting of an invasion of the surrounding tissues and the suture material by polymorphonuclear leukocytes (which subsided after fragmentation of the catgut), attributed to the action of liberated leukocytic enzymes, and a secondary reaction consisting of an invasion of the adjacent tissues and the suture material by macrophages or histiocytes which completed the fragmentation and destruction of the catgut by phagocytic activity. The leukocytic reaction was found to be characteristic of the "rapidly absorbed" class of material, whereas the more "slowly absorbed" classes which survived the first phase were gradually attacked by the phagocytic cells. Foreign body giant cells were also detected in the tissues of the latter class of catgut. With certain exceptions, most brands of plain catgut underwent more or less complete absorption, with the leukocytic response predominating, whereas most varieties of the chromic sutures tended to elicit a less intense initial reaction and were associated with a more conspicuous macrophage response. In general, the severity of the initial tissue response could be correlated with the gross appearance of the different types of catgut and the observations on their tensile strength. The phagocytic cells in the tissues, characteristic of the "slowly absorbed" material, often remained for a long time. Sometimes the chromic catgut remained unabsorbed after periods longer than six months. Fibrous tissue encapsulation of chromic catgut which remained intact for ten days or more was also observed grossly and microscopically. The few instances in which this type of suture underwent rapid absorption were attributed to failure or delay in the encapsulation process. The catgut knot was usually the last portion absorbed when this process was rapid, but it was absorbed more like the rest of the suture when the process was slow. The plain catgut, because of its elicitation of a predominant leukocytic reaction, was regarded as more irritating material than chromic catgut, which usually stimulated fibroblast and macrophage activity. The investigators cite previously reported controversial evidence concerning this point and suggest that irritating chemicals used in the chromicizing process (which were not completely removed) or in the tubing fluid employed for boilable catgut could be a source of irritation where substantial irritation was observed in some chromicized gut products; the bulk of the suture material is also indicated as a factor in irritation. The possibility that a certain amount of the tissue reaction was due to sensitization is discounted in the present study.

The investigators recommend that the larger sizes of chromic catgut for fascial closure of the average case should probably have properties described as "intermediately absorbed" (about ten days' duration of tensile strength and complete absorption in three weeks to three months), because the minimum length of time required for normal healing should be considered as ten days on the basis of the extensive work by Howes and others. However, since the choice of catgut hinges on the bulk of suture material concentrated at any one point in the wound, they suggest that the smaller sizes of the "slowly absorbed" chromic sutures should be employed to provide greater duration of tensile strength with a minimum of bulk in order to avoid the production of draining sinuses sometimes induced by relatively resistant bulky material. They also recommend that the use of smaller sizes of plain catgut, when "rapidly absorbed" material is desired, would minimize the more acute tissue reaction generally attributed to this type of suture. Attention is drawn to other work in support of the use of the smaller sizes of catgut, especially the numerous communications by Howes and others.

The investigators conclude that the fallacy of designating absorption time as a specific number of days, such as ten day, twenty day or forty day, has been clearly demonstrated; that, although the present classification recognizes four different types, their study suggests that not more than three general categories can be reasonably used to classify the absorbability of catgut; that there does not appear to be any major clinical problem of wound closure which cannot be solved by absorbable suture material, and that more uniform standards for the different types of surgical gut manufactured would be of considerable aid to the surgeon in the selection of absorbable suture material best suited to his needs.

IV. RECOMMENDATIONS FOR THE ABSORBABILITY AND DIGESTIBILITY SPECIFICATIONS OF SURGICAL GUT

The fourth part of the study is devoted to the consideration of the specifications, which would appear to be most desirable from the standpoints of the patient and surgeon, as well as of the manufacturer, for the classification of catgut in accordance with the new terminology adopted by the Committee of Revision of the U. S. Pharmacopeia for designating and labeling this suture material under the name "surgical gut." The investigators point out that the division of the various types of surgical gut into type A for plain untreated surgical gut and into types B, C and D for the three grades of treated (chromicized, tanned or otherwise) surgical gut is not as yet accompanied by official statements as to the degree of resistance to digestion or absorption these types of suture material might be expected to possess. However, they indicate that, in the absence of standard specifications, manufacturers undoubtedly have been carrying over, at least to some extent, the specifications formerly used for their plain catgut and for their ten day, twenty day and forty day chromic catgut for products labeled by the new terminology as types A, B, C and D respectively.

On the basis of the experimental and clinical observations over a period of more than five years (as reported in the preceding parts of their study), the investigators propose specifications for the four types of surgical gut which are to be recognized for U. S. P. XII. They indicate that the division of surgical gut into these four types is somewhat arbitrary and subject to some overlapping in view of their studies, which suggest only three general categories. The specifications they recommend are predicated on the basis that type A (plain) is presumed to represent "rapidly absorbed" material, type D (extra chromic) "slowly absorbed" material, type B (mild chromic) "rapidly absorbed" or "intermediately absorbed" material and type C (medium chromic) "intermediately absorbed" or "slowly absorbed" material. In setting up specifications for the four types the investigators proposed, as a reference standard for grading, the use of digestibility data averaged from the results obtained from widely selected specimens of plain untreated heat sterilized surgical gut, if such a batch of this material could be found experimentally and clinically to have a duration of tensile strength of approximately five days, as reported in their studies. It is emphasized, however, that digestibility is the secondary consideration, the primary consideration being absorbability, and that the former is useful only as a means of accomplishing some degree of uniformity by utilization of some readily applied test in an attempt to meet the specifications for the four types of material.

In the specifications recommended by the investigators, time data for both the absorbability and the digestibility of the four types of surgical gut are proposed. The absorbability data for each type are divided into duration of tensile strength in the tissues (subdivided into an average, a theoretical minimum range and a probable maximum range) and ultimate complete absorption in the tissues (given only as an average range). The digestibility data for each type are subdivided like that for the duration of tensile strength in the tissues. The duration of tensile strength in the tissues for each of the four types is expressed as average absorbability with the symbols AAA, AAB, AAC and AAD respectively, theoretical minimum range of absorbability with the symbols TRAA, TRAB, TRAC and TRAD, and probable maximum range of absorbability with the symbols PRAA, PRAB, PRAC and PRAD. The digestibility is similarly expressed as average digestibility with the symbols ADA, ADB, ADC and ADD, theoretical minimum range of digestibility with the symbols TRDA, TRDB, TRDC and TRDD and probable maximum range of digestibility with the symbols PRDA, PRDB, PRDC and PRDD. The absorbability data are given in terms of days, whereas the digestibility data are given in multiples of the average digestibility of type A surgical gut (ADA), defined as the average digestion time in hours of plain catgut in vitro by an enzyme digestion test and to be determined as indicated above by the establishment of a common standard for this material. The values given for the theoretical minimum and probable maximum ranges of digestibility for the various types are elaborated on the basis of the correlation established with the decline of tensile strength in the tissues and in acid pepsin from the previous studies.

The values for all the criteria specified for the absorbability and digestibility of surgical gut (to be tabulated in the original paper) are discussed from the practical standpoint of the use of surgical gut as suture material by the surgeon. The investigators emphasize that in the choice of surgical sutures more attention should be paid to the fundamental principle of minimizing focal bulk of foreign material in wounds, and that use of the smaller sizes of surgical gut of the "slowly absorbed" type offers a basis for a more reliable closure of abdominal wounds without having to resort to nonabsorbable material or to large sizes of slowly absorbed gut, which may lead to a draining sinus. However, doubt is expressed that surgeons can be persuaded to use absorbable material in place of the nonabsorbable material now commonly employed in gastrointestinal anastomosis unless a reliable, relatively highly resistant surgical gut of type D is made generally available by all the manufacturers. They admit that the vagaries of surgical gut and the available methods for assaying its digestibility and absorbability make it obvious that the ranges of values set up in the proposed specifications would be subject to practical variation and that this should be taken into consideration in whatever specifications are ultimately elaborated.

The paper is concluded with the following brief general outline of the specifications recommended for surgical gut:

Type of Surgical Gut	Absorbability in the Tissues: Duration of Tensile Strength	Absorbability in the Tissues: Complete Absorption	Digestibility in Enzymes
Type A	5 days	1 to 3 weeks	ADA
Type B	5 to 10 days	3 wks. to 3 mos.	1 to 2 × ADA
Type C	10 to 15 days	3 to 6 months	2 to 3 × ADA
Type D	15 to 25 days	6 months	3 to 5 × ADA

[EDITOR'S NOTE.—The senior author of the paper reviewed in the foregoing synopsis has indicated that further correlative studies on the absorption of surgical gut with trypsin digestion tests and on the nature of tubing fluids are in progress and will be made the subject of subsequent reports to be submitted for later publication as additional parts of the present series appearing in the *Archives of Surgery*.]

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

AUSTIN E. SMITH, M.D., Acting Secretary.

CALCIUM GLUCONATE (See New and Nonofficial Remedies, 1941, p. 176).

The following dosage forms have been accepted:

PARKE, DAVIS & COMPANY, DETROIT.

Compressed Tablets Calcium Gluconate: 0.5 Gm. (7½ grains) and 1 Gm. (15½ grains).

SODIUM *r*-LACTATE ONE-SIXTH MOLAR (See the Revised Supplement to New and Nonofficial Remedies, 1941, p. 27).

The following product has been accepted:

ABBOTT LABORATORIES, NORTH CHICAGO, ILL.

Solution Sodium-*r*-Lactate ⅙ Molar: 500 cc. and 1,000 cc. bottles. A sterile solution of sodium *r*-Lactate one-sixth molar (1.87% W/V) in distilled water.

SULFAPYRIDINE (See New and Nonofficial Remedies, 1941, p. 511).

The following dosage form has been accepted:

GEORGE A. BREON & CO., INC., KANSAS CITY, MO.

Tablets Sulfapyridine: 0.5 Gm. (7.7 grains).

AMYLCAINE HYDROCHLORIDE (See the Revised Supplement to New and Nonofficial Remedies, 1941, p. 12).

The following additional dosage form has been accepted:

NOVOCOL CHEMICAL MFG. CO., INC., BROOKLYN.

Solution Amylcaine Hydrochloride 4%: 1 ounce and 2 ounce bottles.

MEDICAL LICENSURE STATISTICS FOR 1941

FORTIETH ANNUAL PRESENTATION OF LICENSURE STATISTICS BY THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS OF THE AMERICAN MEDICAL ASSOCIATION

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THE ACCELERATED PROGRAM OF MEDICAL SCHOOLS

As a war measure, programs have been initiated to increase the supply of physicians for the Army, Navy and civilian population by the adoption of an accelerated program of medical education by the various medical schools of the country. In connection with the adoption of such programs, the Council on Medical Education and Hospitals of the American Medical Association, the Association of American Medical Colleges and the Federation of State Medical Boards of the United States in February 1942 adopted resolutions as follows:

Council on Medical Education and Hospitals of the American Medical Association.—The Council is of the opinion that the adoption of a program for an accelerated curriculum for approved medical schools during this war period is a decision which should be determined by each medical school.

The decision of a medical school to initiate an accelerated curriculum should be made only after a comprehensive survey of the personnel, facilities and equipment of the school and its ability to give a medical education without deterioration of the quality of the medical instruction and in conformity with the statutes of the various states and the rulings of the state medical boards.

The Council stands ready to make necessary inspections whenever in its judgment such inspections are required to maintain the present high standards of medical education.

The Council believes that financial assistance for needy medical students during the accelerated program is best provided through scholarships or loans.

Association of American Medical Colleges.—The executive Council requested approval of the recommendations sent to the deans of member colleges Dec. 18 and Dec. 23, 1941 urging member colleges, which can do so without any lowering of present standards of medical education, to go on an accelerated program of instruction on or about July 1, 1942.

Attention is called to the fact that the Executive Council recommended that only those medical colleges that can do so without lowering present standards of medical education should adopt the accelerated program. This applies not only to the utilization of the summer as a teaching period but also to the interval at which freshman classes are admitted; that is, whether annually or at approximate nine month intervals.

The Executive Council recommends that the accelerated program consist of four full academic sessions of not less than thirty-two weeks each and that graduation shall not follow sooner than thirty-five months after first matriculation as a freshman.

The Executive Council recommends that as many colleges as can do so start instruction of the next freshman class on or about July 1, 1942 and subsequent freshman classes at approximately nine months intervals until July 1, 1945.

The Executive Council recommends that, in admitting students for the accelerated program, eligibility requirements for admission be not lowered from the present minimum standards set by the Association of American Medical Colleges.

The Association of American Medical Colleges requests that the Federation of State Medical Boards recommend to its members that they arrange to make whatever changes are necessary in state licensing laws and/or board regulations to legalize licensure of students graduating under the accelerated program adopted by medical schools to meet the needs of the national emergency.

Federation of State Medical Boards of the United States.—WHEREAS, As a war emergency measure several approved medical schools of the United States are contemplating to accelerate the courses of medical education so as to comprise four full academic sessions of at least thirty-two weeks each and that at least thirty-six months shall elapse between the beginning of medical instruction and graduation; and

WHEREAS, The medical schools initiating such an accelerated curriculum will be able to maintain the personnel, facilities and equipment necessary to give a medical education without deterioration of the quality of the medical instruction and in conformity with the statutes and licensure regulations of their respective states and territories of the United States and the District of Columbia; and

WHEREAS, The proposed accelerated course of medical education as a war emergency measure is expected not to extend beyond the present period of war emergency; therefore be it

Resolved, That the Federation of State Medical Boards of the United States in annual session assembled in Chicago, Feb. 17, 1942 hereby endorse the proposed accelerated course of medical education and recommend it in principle as a war emergency measure for favorable consideration by the licensing authorities of the several states and territories of the United States and the District of Columbia.

In adopting these resolutions, all three agencies emphasized the importance of the maintenance of high standards of medical education in connection with any program adopted.

There are many problems involved in connection with the proposed changes in the program of medical education. With the curriculum extending throughout the

calendar year with only a brief vacation between sessions, students will have little or no opportunity to seek employment for the purpose of financing their medical education. There is, however, some promise that loan funds and scholarship funds may be made available through the deans of the various medical schools to assist in the financing of needy students. Through the Association of American Medical Colleges, application has been made for federal funds for this purpose. The W. K. Kellogg Foundation is initiating a plan involving the availability of funds to meet the immediate emergency offering to one hundred and fifty schools of medicine, dentistry, public health and nursing in the United States and Canada, funds to be used for either loans or scholarships.

Another difficulty involved will be that of correlating or integrating the graduation of medical students every nine months with the customary one year rotating internships.

In order to present a clear picture of the programs of the various medical schools, questionnaires were sent by the Council and in table 1 are listed these schools with as accurate information as has been obtainable with regard to the details of their program. In table 2 are listed the schools of the basic medical sciences with similar data regarding their programs.

TABLE 1.—*Program of Medical Schools in the United States, 1942-1943*

School	Session Begins			Graduation	
	1942-1943 2d, 3d & 4th Years	Entering Class	Subsequent Entering Class—1943	1942 Class	Subsequent Class 1943
University of Arkansas School of Medicine	September	September	September	June	June
University of California Medical School	June	June	February	May	February
College of Medical Evangelists	July	July	July	June	April *
University of Southern California School of Medicine	June	June	June	June	January *
Stanford University School of Medicine	June	June	June	June	March *
University of Colorado School of Medicine	June	June	March	June	March
Yale University School of Medicine	June	June	April	June	March (a)
Georgetown University School of Medicine	June	June	March	May	March
George Washington University School of Medicine	June	June	February	June	February
Howard University College of Medicine	September	September	September	June	June
Emory University School of Medicine	June	June	March	June	March
University of Georgia School of Medicine	July	July	April	June	March
Loyola University School of Medicine	July	July	April	June	April *
Northwestern University Medical School	June	June	March	June	Aug. 1942* (b)
University of Chicago, The School of Medicine	June	June	March	June	Aug. 1942 (b)
University of Illinois College of Medicine	June (c)	September	June	June	March
Indiana University School of Medicine	May	May	January	May	January
State University of Iowa College of Medicine	May	June	February	May	February
University of Kansas School of Medicine	September	September (d)	September (d)	June	June (d)
University of Louisville School of Medicine	July	July	April	May	February
Louisiana State University School of Medicine	June	June	March	(e)	March
Tulane University of Louisiana School of Medicine	September	September	September	June	April
Johns Hopkins University School of Medicine	June	June	March	June	March
University of Maryland School of Medicine and Coll. of P. and S.	June	June	April	May	March
Boston University School of Medicine	June	June	March	June	February
Harvard Medical School	July	July	March	June	March
Tufts College Medical School	July	July	April	June	March
University of Michigan Medical School	June	October	October	May	February
Wayne University College of Medicine	June	June	April	June	March *
University of Minnesota Medical School	June	June	March	June	March *
St. Louis University School of Medicine	June	June	February	June	March
Washington University School of Medicine	June	July	March	June	March
Creighton University School of Medicine	July	July	March	June	March
University of Nebraska College of Medicine	June	June	March	May	March
Albany Medical College	July	July	July	June	March
Long Island College of Medicine	July	July	March	June	March
University of Buffalo School of Medicine	July	July	July	June	March
Columbia University College of Physicians & Surgeons	July	July	March	June	March
Cornell University Medical College	July	July	April	June	March
New York Medical College, Flower & Fifth Ave. Hosps.	July	July	April	June	April
New York University College of Medicine	June	June	April	June	April
University of Rochester School of Medicine	July	July	March	June	March
Syracuse University College of Medicine	July	July	July	June	March
Duke University School of Medicine	July	July	March	June	March *
Bowman Gray School of Medicine of Wake Forest College	June	June	March	(f)	December
University of Cincinnati College of Medicine	June	June	March	June	February
Western Reserve University School of Medicine	June	June	March	June	February
Ohio State University College of Medicine	June	June	March	June	March
University of Oklahoma School of Medicine	September	September	September	June	June
University of Oregon Medical School	June	June	March	June	March
Hahnemann Medical College and Hospital of Philadelphia	July	July	April	June	March
Jefferson Medical College of Philadelphia	August (g)	June	April	June	February
Temple University School of Medicine	July	August	June	June	March
University of Pennsylvania School of Medicine	July	July	April	(h)	April
Woman's Medical College of Pennsylvania	September (i)	September	(j)	June	March
University of Pittsburgh School of Medicine	July	July	March	June	March
Medical College of the State of South Carolina	June	June	March	June	March
University of Tennessee College of Medicine	July	July	(k)	June	(k)
Meharry Medical College	September	September	September	May	May
Vanderbilt University School of Medicine	June	June	March	June	March
Baylor University College of Medicine	September	September	September	June	June
University of Texas Medical Branch (m)	March (l)	June	March	(n)	Dec. 1942
University of Vermont College of Medicine	July	July	April	June	March
University of Virginia Department of Medicine	June	June	March	June	March
Medical College of Virginia	July	July	April	June	March
University of Wisconsin Medical School	July	July	July	June	March
Marquette University School of Medicine	July	July	March	May	March *

* Internship required for M.D. degree.
(a) Commencement June 1943.
(b) Quarterly graduation.
(c) Second year—September.
(d) Students may take laboratory and clinical courses in summer quarters. M.D. awarded special students in September.
(e) Senior year accelerated 1941-1942—M.D. conferred March 1942.
(f) No seniors 1941-1942.
(g) Seniors—June.
(h) Senior year accelerated 1941-1942—M.D. conferred May 2, 1942.
(i) Seniors—July.
(j) Undecided.
(k) Operated on four quarter plan—new students admitted and classes graduated every quarter.
(l) Classes in session since March 23, 1942.
(m) Entire curriculum accelerated session 1941-1942.
(n) Senior year accelerated 1941-1942—M.D. conferred March 20, 1942.

The following schools have adopted the accelerated curriculum involving both the acceptance of entering students and the graduation of a class every nine months:

University of California Medical School
University of Colorado School of Medicine
Yale University School of Medicine
Georgetown University School of Medicine
George Washington University School of Medicine
Emory University School of Medicine
University of Georgia School of Medicine
Loyola University School of Medicine
Northwestern University Medical School
University of Chicago, The School of Medicine
University of Illinois College of Medicine
Indiana University School of Medicine
State University of Iowa College of Medicine
University of Louisville School of Medicine
Louisiana State University School of Medicine
Johns Hopkins University School of Medicine
University of Maryland School of Medicine and College of Physicians and Surgeons
Boston University School of Medicine
Harvard Medical School
Tufts College Medical School
Wayne University College of Medicine
University of Minnesota Medical School
St. Louis University School of Medicine
Washington University School of Medicine
Creighton University School of Medicine
University of Nebraska College of Medicine
Long Island College of Medicine
Columbia University College of Physicians and Surgeons
Cornell University Medical College
New York Medical College, Flower and Fifth Avenue Hospitals
New York University College of Medicine
University of Rochester School of Medicine
Duke University School of Medicine
Bowman Gray School of Medicine of Wake Forest College
Western Reserve University School of Medicine
Ohio State University College of Medicine
University of Cincinnati College of Medicine
University of Oregon Medical School
Hahnemann Medical College and Hospital of Philadelphia
Jefferson Medical College of Philadelphia
Temple University School of Medicine
University of Pennsylvania School of Medicine
University of Pittsburgh School of Medicine
Medical College of the State of South Carolina
Vanderbilt University School of Medicine
University of Vermont College of Medicine
University of Virgina Department of Medicine
Medical College of Virginia
Marquette University School of Medicine

Eleven schools have adopted an accelerated curriculum involving the graduation of a class every nine months but will admit an entering class on an annual basis as follows:

College of Medical Evangelists
University of Southern California School of Medicine
Stanford University School of Medicine
Tulane University of Louisiana School of Medicine
University of Michigan Medical School
Albany Medical College
University of Buffalo School of Medicine
Syracuse University College of Medicine
Woman's Medical College of Pennsylvania
University of Texas Medical Branch
University of Wisconsin Medical School

The University of Tennessee College of Medicine will operate as in the past on the four quarter plan, admitting new students and graduating a class every quarter.

Eight schools have not adopted an accelerated program namely:

University of Arkansas School of Medicine
Howard University College of Medicine
University of Kansas School of Medicine
University of North Dakota School of Medicine
University of Oklahoma School of Medicine
University of South Dakota School of Medical Sciences
Meharry Medical College
Baylor University College of Medicine

As has been pointed out, there are many difficulties involved in the acceleration of the program, and where a school has failed to adopt such a program in order to maintain satisfactory standards it is to be commended rather than criticized.

The acceleration of the training of medical students to the end that graduation will occur following three calendar years of instruction raises questions concerning medical licensure that demand consideration along with a consideration of the merits of the proposal itself.

The medical practice acts of the several states define the standards that a medical school must maintain in order that graduates may qualify for licensure. If those standards are defined in such a way that courses of study must be given in four different calendar years, the obvious result will be that graduates after the abbreviated course will be disqualified for licensure unless the standards are reset by amendatory legislation.

TABLE 2.—*Program of Schools of the Basic Medical Sciences, 1942-1943*

School	Session Begins		
	1942-1943		
	2d Year	Entering Class	Subsequent Entering Class—1943
University of Alabama School of Medicine	June	June	March
University of Mississippi School of Medicine	June	June	January
University of Missouri School of Medicine	June	June*	March
Dartmouth Medical School	May	May	February
University of North Carolina School of Medicine	June	June	March
University of North Dakota School of Medicine	September	September	September
University of South Dakota School of Medical Sciences	September	September	September
University of Utah School of Medicine	June	June	March
West Virginia University School of Medicine	June	June	March

The situation in the several states in this respect may be briefly summarized as follows, the summary being based on the provisions of the several medical practice acts:

In the following seven states there are statutory provisions that would seem to require modification before licenses can be granted to persons who have graduated after three calendar years of instruction:

Georgia	Maryland	Nebraska
Illinois	Michigan	New Jersey
Kansas		

In the following five states statutory provisions obtain that may necessitate rather liberal construction to permit the granting of such licenses:

Kentucky	Mississippi	Tennessee
Massachusetts	North Carolina	

In twenty-eight states and in the District of Columbia the statutory provisions seem to be broad enough to permit the granting of licenses to such graduates if the

examining boards or other state approving agencies will recognize a medical school that graduates students after the abbreviated course of study. In these states, if standards have been set up by examining boards or other approving state agencies by rule or regulation and if existing standards preclude the licensure of graduates after abbreviated courses, the rules or regulations must be amended to permit such licensure:

Alabama	Louisiana	Rhode Island
California	Maine	South Carolina
Colorado	Minnesota	South Dakota
Connecticut	Missouri	Texas
Delaware	Montana	Utah
District of Columbia	New Hampshire	Vermont
Florida	New York	Virginia
Idaho	North Dakota	Wisconsin
Indiana	Ohio	Wyoming
Iowa	Pennsylvania	

In the remaining eight states, graduates after the abbreviated course may obtain licensure if the school of graduation is one approved by the Association of American Medical Colleges or, in the case of two states, Arkansas and Oregon, and possibly a third, West Virginia, by the Council on Medical Education and Hospitals of the American Medical Association:

Arizona	New Mexico	Washington
Arkansas	Oklahoma	West Virginia
Nevada	Oregon	

Within the next few months an attempt will be made to develop a fairly accurate approximation of the number of trained personnel to be secured by this process of speeding the production of physicians and to ascertain whether the number of physicians so trained will be adequate to supply the anticipated needs of the military and civilian population for new graduates during the next few years.

STATE BOARDS OF MEDICAL EXAMINERS

The fortieth annual compilation of medical licensure and allied statistics by the Council on Medical Education and Hospitals is here presented. The report for the year 1941 includes data regarding (*a*) medical examining and licensing boards of the United States, the District of Columbia, the territories and the possessions of the United States, (*b*) examining boards in the medical specialties, (*c*) boards of examiners in the basic sciences and (*d*) the National Board of Medical Examiners.

TABLE 1.—*Licenses Issued, 1941*

	On the Basis of		
	Examination	Reciprocity and Endorsement	Total
Alabama	24	63	87
Arizona	17	19	36
Arkansas	60	23	83
California	401	229	630
Colorado	54	34	88
Connecticut	65	74	139
Delaware	18	4	22
District of Columbia	33	67	100
Florida	143	..	143
Georgia	94	36	130
Idaho	29	..	29
Illinois	474	107	581
Indiana	120	97	217
Iowa	66	47	113
Kansas	92	22	114
Kentucky	80	47	127
Louisiana	145	12	157
Maine	38	29	67
Maryland	176	27	203
Massachusetts	251	100	351
Michigan	226	188	414
Minnesota	240	29	269
Mississippi	38	37	75
Missouri	196	83	279
Montana	7	20	27
Nebraska	92	13	105
Nevada	4	12	16
New Hampshire	10	34	44
New Jersey	155	107	262
New Mexico	2	29	31
New York	886	287	1,173
North Carolina	54	65	119
North Dakota	15	10	25
Ohio	293	116	409
Oklahoma	54	39	93
Oregon	22	32	54
Pennsylvania	446	93	539
Rhode Island	22	13	35
South Carolina	45	17	62
South Dakota	8	7	15
Tennessee	198	58	256
Texas	177	113	290
Utah	17	10	27
Vermont	18	14	32
Virginia	146	71	217
Washington	69	60	129
West Virginia	34	59	93
Wisconsin	120	52	172
Wyoming	8	12	20
U. S. Terr. & Possessions*	38	21	59
Totals	6,020	2,738	8,758

* Alaska, Hawaii, Puerto Rico and the Virgin Islands.

The official reports which form the basis for these compilations have been contributed throughout the year by the medical licensing boards of all states, the District of Columbia, Alaska, Hawaii, Puerto Rico and the Virgin Islands; the homeopathic medical examining boards of Connecticut, Delaware and Maryland; the seventeen boards of examiners in the basic sciences in operation last year (Arizona, Arkansas, Colorado, Connecticut, the District of Columbia, Florida, Iowa, Michigan, Minnesota, Nebraska, New Mexico, Oklahoma, Oregon, Rhode Island, South Dakota, Washington and Wisconsin); the fifteen approved examining boards in the medical specialties, namely anesthesiology, dermatology and syphilology, internal medicine, neurologic surgery, obstetrics and gynecology, ophthalmology, orthopedic surgery, otolaryngology, pathology, pediatrics, plastic surgery, psychiatry and neurology, radiology, surgery and urology; and the National Board of Medical Examiners. The homeopathic and eclectic examining boards in Arkansas and the homeopathic board in Louisiana did not license any one during the year. Likewise no physicians were registered for civilian practice in the Canal Zone.

The cooperation of the officers of these agencies in furnishing complete reports makes possible these annual compilations. The Council and THE JOURNAL express thanks and appreciation to those who have supplied data, for without such help the presentation of the calculations included in the following pages would not have been possible.

Dates of coming examinations of state licensing and basic science boards, specialty boards and the National Board of Medical Examiners appear weekly in THE JOURNAL in the department "Medical Examinations and Licensure." The results of such tests are furnished the office of the Council, are recorded on the biographic record of the physician concerned, are published weekly in THE JOURNAL and then are permanently preserved in the archives of the American Medical Association.

For a period of twelve years beginning in 1926 the credentials of physicians coming from abroad have been verified by official correspondence with the medical

school, either directly or through the diplomatic services. This has been impossible for the last several years, and on the licensing boards in the various states rests the responsibility of determining the authenticity of the evaluation of credentials presented from schools outside the United States and Canada. Statistics are presented separately enumerating data regarding physicians examined on the basis of certificates obtained in countries other than the United States and Canada during 1941.

TABLE 2.—*Licenses Issued, 1935-1941*

	Examination	Reciprocity and Endorsement	Total
1935	5,725	2,194	7,919
1936	6,275	2,772	9,047
1937	6,629	3,204	9,833
1938	6,557	2,956	9,513
1939	6,400	2,872	9,272
1940	6,289	2,864	9,153
1941	6,020	2,738	8,758
Totals	43,895	19,600	63,495

More than half of the examining and certifying boards obtain from the Council verification of biographic data and other claims before granting a license or permission to take the licensing examination. This service is available to all boards.

The tables referring to medical licensing boards include figures regarding the number of candidates examined in 1941, the number licensed and the number added to the profession. The state boards are discussed first, followed by the specialty examining boards, the basic science boards and the National Board of Medical Examiners.

LICENSES ISSUED

The figures presented in the first table cover the number of licenses issued in the various states, territories and possessions, both by examination and reciprocity or endorsement of state licenses or by the certificate of the National Board of Medical Examiners. During the year 1941 there were 8,758 licenses issued to practice medicine and surgery in the forty-eight states, the District of Columbia, Alaska, Hawaii, Puerto Rico and the Virgin Islands. Of the 8,758 licenses, 6,020 were issued after examination and 2,738 by reciprocity and endorsement.

Twenty states, the District of Columbia, Alaska, Hawaii and Puerto Rico require that applicants for licensure possess a hospital internship (table 22). However, the licensing boards permit the candidate to take the examination and, if successful, the license is withheld until completion of the internship. The 8,758 licenses issued include, therefore, many candidates who were examined in 1940 and even a few in previous years. Licenses are also withheld for proof of citizenship and minor technicalities. In some states also the licenses of those examined in December are dated and issued early in the following year. The figures in this table therefore will not correspond with those hereinafter given.

The greatest number of licenses during 1941 were issued in New York, 1,173; California granted 630, Illinois 581 and Pennsylvania 539. These were the only states which registered more than 500. Twenty-two states and the territories and possessions issued licenses to fewer than 100. The fewest number (15) were issued in South Dakota. Nevada licensed 16 and Delaware 22. An interesting point to observe is the fact that in some states the number registered without examination far exceed those required to write an examination, while on the other hand in many states the reverse was the case. The latter is particularly significant in New York, where 886 took examinations and 287 received licenses by endorsement of their credentials. Louisiana issued only 12 of its 157 licenses on the basis of credentials only. Three were registered in the Virgin Islands, 11 in Alaska, 14 in Puerto Rico and 31 in Hawaii. Of these 21 were granted certificates by endorsement of credentials: 5 in Alaska, 13 in Hawaii and 3 in the Virgin Islands. The states of Florida and Idaho grant licenses only on the basis of examination. Massachusetts, Rhode Island and Hawaii have no reciprocity agreements but endorse diplomates of the National Board of Medical Examiners.

Figures for six previous years and 1941 giving totals for each year for the number of licenses issued on the basis of examination and endorsement of credentials are contained in table 2. Since 1937, fewer licenses have been issued annually. In 1941 there were 395 fewer licenses issued than in 1940 and 1,075 less than in 1937. The increase in that year of over 800 greater than in 1936 represented largely physicians migrating to this country from Europe.

Licenses issued do not, however, represent individuals, since several have been licensed in more than one state during the year. Nor does the total represent additions to the medical profession at large, since those licensed by reciprocity and endorsement, with the exception of the National Board of Medical Examiners, have previously been registered. Table 15 shows how many of those licensed were not previously granted licenses to practice medicine and therefore represent the number added to the medical profession in the United States and its territories and possessions.

In seven years, 63,495 medical licenses have been issued, 43,895 by examination and 19,600 by endorsement of credentials.

CANDIDATES EXAMINED BY MEDICAL EXAMINING BOARDS

Compilations referring to those examined for medical licensure by individual states throughout the year, indicating the number who passed and failed in each state and the medical school of graduation, are recorded in table 4. There were 7,511 examined, of whom 6,030 passed and 1,481 failed, representing sixty-seven medical schools in the United States and nine of the medical schools of Canada, one hundred and one faculties of medicine and three licensing corporations of other countries, eight medical schools now extinct, seven unapproved institutions and six colleges of osteopathy. Osteopaths who are granted the privilege to practice medicine, surgery, or both, by the medical examining board are included in these statistics, elimi-

TABLE 3.—*Source of Candidates Examined, 1941*

Medical Schools	Number	Number Examined	Number Passed	Number Failed	Percentage Failed
Approved, in United States	67	5,206	4,966	240	4.6
Approved, in Canada	9	167	142	25	15.0
Extinct	8	8	4	4	50.0
Foreign	104	1,708	690	1,018	59.6
Unapproved	13	422	228	194	46.0
Totals	201	7,511	6,030	1,481	19.7

(CONTINUED ON PAGE 148)

Marginal Number	SCHOOL	1 Alabama P F	2 Arizona P F	3 Arkansas P F	4 California P F	5 Colorado P F	6 Connecticut P F	7 Delaware P F	8 Dist. Columbia P F	9 Florida P F	10 Georgia P F	11 Idaho P F	12 Illinois P F	13 Indiana P F	14 Iowa P F	15 Kansas P F	16 Kentucky P F	17 Louisiana P F	18 Maine P F	19 Maryland P F	20 Massachusetts P F	21 Michigan P F	22 Minnesota P F	Marginal Number
	ARKANSAS																							
1	University of Arkansas School of Medicine			60 0						2 0														1
	CALIFORNIA																							
2	College of Medical Evangelists		2 0		55 1	3 0				1 0	1 0	1 0	1 0	2 0		1 0		1 0			6 0			2
3	Stanford University School of Medicine				53 2																		1 0	3
4	University of California Medical School				51 0																			4
5	University of Southern California Sch. of Med.		2 0		47 0									1 0										5
	COLORADO																							
6	University of Colorado School of Medicine			3 0	39 0							2 0									1 0	2 0		6
	CONNECTICUT																							
7	Yale University School of Medicine						3 0			1 0									1 0	1 0	2 0	2 0		7
	DISTRICT OF COLUMBIA																							
8	George Washington University School of Med.	1 0	1 0		6 0		1 0		14 0	2 0		1 0		1 0				1 0	6 0				1 0	8
9	Georgetown University College of Medicine			3 0		0 1		8 0	2 0									1 0	3 0	2 0			1 0	9
10	Howard University College of Medicine	1 0				1 0		3 0		1 0			5 0						5 0					10
	GEORGIA																							
11	Emory University School of Medicine	3 0							16	1 47	1												1 0	11
12	University of Georgia School of Medicine								4	0 37	0													12
	ILLINOIS																							
13	Loyola University School of Medicine		1 0		5 1	1 0	1 0			5 0			63 0	3 0	2 0						1 1	3 0	1 0	13
14	Northwestern University Medical School	1 0	1 0		8 1	2 0	1 0					3 0	54 0	3 0		3 0		2 0	1 0	2 0	11 0	15 0	4 1	14
15	University of Chicago, Rush Medical College	1 0	2 0		8 0	2 0	1 0		1 0	3 0		2 0	45 0	1 0			2 0	1 0	1 0	3 0	4 0	7 0	8	15
16	University of Chicago, The School of Medicine				4 0				1 0			1 0	18 0	1 0		1 0	1 0		1 0		2 0	3 0		16
17	University of Illinois College of Medicine				8 0					3 0	1 0	1 0	133 3	2 0							2 0	1 0	7	17
	INDIANA																							
18	Indiana University School of Medicine				2 0									98 0							1 0	1 0	4 0	18
	IOWA																							
19	State University of Iowa College of Medicine		1 0		3 0	1 0				1 0			1 0			58 1				1 0	1 0	3 0	19
	KANSAS																							
20	University of Kansas School of Medicine		1 0		3 0										79 0						1 0			20
	KENTUCKY																							
21	University of Louisville School of Medicine	2 0			1 0		2 0			4 0		2 0		2 0			74 0						2 0	21
	LOUISIANA																							
22	Louisiana State University School of Medicine											1 0						64 0					1 0	22
23	Tulane University of Louisiana School of Med.	9 0	2 0				1 0			14 0					2 0	2 0	70 1				2 0	1 0	2 0	23
	MARYLAND																							
24	Johns Hopkins University School of Medicine			3 0		1 0		1 0	4 0	1 0	1 0								49 0	3 0	1 0	7 0	24	
25	University of Maryland School of Medicine and College of Physicians and Surgeons					1 0	2 0		3 0							1 0			64 1			1 0	25	
	MASSACHUSETTS																							
26	Boston University School of Medicine	0 1			1 0						0 1							1 1		3 0				26
27	Harvard Medical School			4 0		5 1				4 1			3 0					6 0	3 0	33 0	4 0	5 0	27	
28	Tufts College Medical School					3 1		1 0	1 0									3 1		11 0				28
	MICHIGAN																							
29	University of Michigan Medical School			2 0		1 0				1 0		2 0	1 0								116 0	1 0	29	
30	Wayne University College of Medicine							1 0		1 0										1 0	54 0			30
	MINNESOTA																							
31	University of Minnesota Medical School			5 0						4 0		1 0		1 0		1 0	1 0		1 0		4 0	109 0	31	
	MISSOURI																							
32	St. Louis University School of Medicine		1 0		3 0		2 0						1 0		1 0	1 0					2 0	2 0	32	
33	Washington University School of Medicine	1 0			2 0		1 0		1 0	4 0			2 0								2 0	2 0	33	
	NEBRASKA																							
34	Creighton University School of Medicine			14 1								1 0				5 0		2 0			2 0	3 0	34	
35	University of Nebraska College of Medicine			2 1		1 0				1 0	1 0	3 0								3 0		3 0	35	
	NEW YORK																							
36	Albany Medical College																			1 0				36
37	Columbia University Coll. of Phys. and Surgs.			3 0		10 0		1 0	4 1	1 0								4 0					1 0	37
38	Cornell University Medical College					5 1	1 0			1 0		1 0	1 0							2 0	1 0	2 0	38	
39	Long Island College of Medicine					1 0				4 0										1 0		1 0	39	
40	New York Medical College, Flower and Fifth Avenue Hospitals						2 0			2 0										1 0				40
41	New York University College of Medicine					5 0				5 0			1 0			1 0								41
42	Syracuse University College of Medicine									1 0	1 0										1 0	1 0	42	
43	University of Buffalo School of Medicine									1 0											1 0	1 0	43	
44	Univ. of Rochester Sch. of Med. and Dentistry			1 0						1 0			1 0				1 0		2 0	1 0	2 0	4 0	44	
	NORTH CAROLINA																							
45	Duke University School of Medicine									4 0			1 0					1 0	1 0		1 0	2 0	45	
	OHIO																							
46	Ohio State University College of Medicine									2 1												2 0	46	
47	University of Cincinnati College of Medicine			1 0						3 0										3 0		2 0	47	
48	Western Reserve University School of Medicine									1 0											1 0		48	
	OKLAHOMA																							
49	University of Oklahoma School of Medicine			3 0	2 0	1 0						1 0										1 0	49	
	OREGON																							
50	University of Oregon Medical School			11 0								2 0	2 0	1 0				1 0	1 0			4 0	50	
	PENNSYLVANIA																							
51	Hahnemann Medical Coll. and Hosp. of Phila.						3 0	2 0		2 0			2 0					1 1	8 0	3 5		1 0	51	
52	Jefferson Medical College of Philadelphia	1 0			2 0		2 0	8 0	1 0	2 0	1 0		1 0					1 0	3 0	4 0	1 0		52	
53	Temple University School of Medicine				3 0		1 0	2 0		6 0		1 0						1 0	2 0	1 0		1 0	53	
54	University of Pennsylvania School of Medicine	2 0			3 0			1 0		2 0		1 0	2 0			2 0		3 0	5 0	5 0	6 0	4 0	54	
55	University of Pittsburgh School of Medicine									2 0										1 0			55	
56	Woman's Medical College of Pennsylvania	1 0					1 0												1 0				56	
	SOUTH CAROLINA																							
57	Medical College of the State of South Carolina									2 0							1 0						57	
	TENNESSEE																							
58	Meharry Medical College									3 1								1 0					58	
59	University of Tennessee College of Medicine	2 0		3 0			1 0			2 0		1 0	2 0			1 0						1 0	59	
60	Vanderbilt University School of Medicine			1 0		1 0				3 0												1 0	60	

P = Passed; F = Failed.

Marginal Number	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	Alaska, Hawaii and Puerto Rico	Totals	Examined—Passed	Examined—Failed	Percentage—Failed	No. Boards Examined by	Marginal Number
	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F						
1		0 1			0 1				2 2		1 0 1 0 1 0																		71	67	4	5.6	8	1
2		1 0									1 0			5 0 3 0										6 0 1 0 1 0 2 0					95	94	1	1.1	19	2
3																												1 0	57	55	2	3.5	3	3
4																													51	51	0	0.0	1	4
5																													50	50	0	0.0	3	5
6																	1 0										1 0		49	49	0	0.0	7	6
7		1 0					1 0 1 0		1 0			1 0														1 0			16	16	0	0.0	12	7
8			1 0				1 0		2 3						4 0				1 0			1 0 2 0 1 0			1 0				52	49	3	5.8	20	8
9							12 0		14 9 3 0						6 0 3 0							1 0			1 0				70	60	10	14.3	15	9
10									1 1			1 0			2 0				2 0				6 0		2 0				31	30	1	3.2	12	10
11	1 0								1 0	2 0							1 0												74	72	2	2.7	8	11
12	1 0																												42	42	0	0.0	3	12
13	1 0					4 0			6 3			2 0			1 0 1 0								6 0		3 0 1 0 1 0				117	112	5	4.3	21	13
14	1 0 8 0 1 0 1 0					2 0 1 0			2 2		3 0 4 0				1 0						2 0		4 0 1 0 8 0						149	146	3	2.0	28	14
15	1 0				1 0				6 3	2 0 2 0 2 0					1 0 1 0				3 0		2 0 8 0		5 0 1 0 5 0					128	125	3	2.3	31	15
16						1 0			1 0		1 0 1 0				3 0								1 0 1 0						42	42	0	0.0	17	16
17	1 0				1 0				2 1					1 0						1 0			2 1 1 0 7 0				2 0		174	169	5	2.9	17	17
18									1 0						2 0														109	109	0	0.0	7	18
19																									1 0 1 0				73	72	1	1.4	11	19
20	1 0								1 0					2 0									1 0						89	89	0	0.0	8	20
21							1 0		7 0						1 0				1 0				2 0 2 0 2 0 1 0						106	106	0	0.0	16	21
22	4 0								2 1						1 0							1 0						1 0	76	75	1	1.3	8	22
23	13 0						1 0		1 0 1 0								2 0			2 0			1 0	1 0				2 0	130	129	1	0.8	19	23
24	1 0				1 0				2 0						3 0														78	78	0	0.0	14	24
25									1 1 4 0						2 0										3 0			2 0	86	84	2	2.3	11	25
26									3 1							1 0						1 0							14	10	4	28.6	8	26
27							1 0		10 4 2 0			3 0			4 0 1 0								2 0				1 0		97	91	6	6.2	17	27
28						1 0 2 0			1 1						4 0							1 0							31	28	3	9.7	10	28
29									2 2		1 0				2 0										1 0				132	130	2	1.5	11	29
30									0 1																				58	57	1	1.7	5	30
31									1 1		5 1				1 0			1 0					2 0		3 0		2 0		144	142	2	1.4	16	31
32	76 0								14 5						3 0 1 0			1 0			1 0		1 0			1 0			116	111	5	4.3	16	32
33	1 0 91 0				1 0				1 1					1 0	1 0			1 0		1 0 1 0			2 0		1 0		1 0		119	118	1	0.8	20	33
34			21 0				1 0		1 4			2 0			1 0								3 0				3 1		65	59	6	9.2	13	34
35	1 0		70 0						2 2					1 0 2 0											1 0		1 0		95	92	3	3.2	14	35
36									1 0																				2	2	0	0.0	2	36
37							6 0		67 10			2 0 1 0				2 0						1 0	2 0						116	105	11	9.5	14	37
38							1 0		41 7 1 0			1 0			3 0								1 0 1 0				1 0		72	64	8	11.1	16	38
39	1 0						3 1		52 17 1 0						1 0				0 1										84	65	19	22.6	10	39
40							3 0		3 3																				14	11	3	21.4	5	40
41	1 0						10 0		83 20			1 0			1 0								1 0		1 0				130	110	20	15.4	11	41
42									27 12						2 0 1 0														46	34	12	26.1	7	42
43	1 0								14 4						1 0														23	19	4	17.4	6	43
44									20 13			5 0			1 0														52	39	13	25.0	11	44
45										2 0													2 0						14	14	0	0.0	8	45
46									1 1			69 1			1 0												0 1		79	75	4	5.1	6	46
47									2 1			72 2						1 0							1 0		1 0		89	86	3	3.4	9	47
48												60 0			2 0								1 0						65	65	0	0.0	5	48
49	1 0											1 0 51 0										2 0					1 0		65	65	0	0.0	11	49
50									1 0					11 0									11 0				3 0		48	48	0	0.0	11	50
51							19 2		4 15 1 0			12 0			71 7 1 0			1 0							1 0 1 0		2 0		165	135	30	18.2	18	51
52	3 0						9 0		2 3 10 0			5 0			78 0 2 0 1 0			1 0					1 0 1 0 3 0			1 0			147	144	3	2.1	25	52
53							8 1		8 5 6 0						68 2				1 0 2 0 1 0				1 0		2 0 2 0				125	117	8	6.4	19	53
54	1 0						8 1		10 0 6 0						83 0				1 0 2 0 1 0				1 0 3 0		1 0 1 0				155	154	1	0.6	24	54
55															44 0												1 0		48	48	0	0.0	4	55
56									1 1			1 0			10 0														16	15	1	6.3	6	56
57										3 0					2 0		39 0												47	47	0	0.0	5	57
58									0 2						1 1				48 0										57	53	4	7.0	5	58
59	16 0	1 0					1 0		3 3 1 0						1 0				90 3						1 0				133	126	7	5.3	16	59
60	1 0								2 0 1 0										52 0										62	62	0	0.0	8	60

TABLE 4.—CANDIDATES EXAMINED BY MEDICAL

Marginal Number	SCHOOL	1 Alabama P	F	2 Arizona P	F	3 Arkansas P	F	4 California P	F	5 Colorado P	F	6 Connecticut P	F	7 Delaware P	F	8 Dist. Columbia P	F	9 Florida P	F	10 Georgia P	F	11 Idaho P	F	12 Illinois P	F	13 Indiana P	F	14 Iowa P	F	15 Kansas P	F	16 Kentucky P	F	17 Louisiana P	F	18 Maine P	F	19 Maryland P	F	20 Massachusetts P	F	21 Michigan P	F	22 Minnesota P	F
	TEXAS																																												
61	Baylor University College of Medicine							2	0																															2	0				
62	University of Texas Medical Branch							1	0									1	0															1	0					1	0			6	0
	VERMONT																																												
63	University of Vermont College of Medicine											1	0																											1	0				
	VIRGINIA																																												
64	Medical College of Virginia							3	0									4	0																							2	0		
65	University of Virginia Department of Medicine													1	0			1	0																					1	0			2	0
	WISCONSIN																																												
66	Marquette University School of Medicine							4	0			1	1																													2	0	3	0
67	University of Wisconsin Medical School		1	0				5	0	1	0							1	0					1	0									1	0					0	1	1	0	6	0
	CANADA																																												
68	Dalhousie University Faculty of Medicine																																												
69	Laval University Faculty of Medicine							1	0																													1	1						
70	McGill University Faculty of Medicine		1	0				11	0			1	0											1	0									1	0	2	0	2	0	3	1	3	0	3	0
71	Queen's University Faculty of Medicine											1	0			1	0	1	0																							1	0		
72	University of Alberta Faculty of Medicine																							1	0																				
73	University of Manitoba Faculty of Medicine																																										4	0	7
74	University of Montreal Faculty of Medicine																																					0	2							7
75	University of Toronto Faculty of Medicine		1	0				11	0			2	0					0	1	1	0			3	1			1	1							1	0	3	0	1	0			2
76	University of Western Ontario Medical School											2	0											1	0											1	0					4	0	7
77	Foreign Medical Faculties							35	4			13	28									1	0	78	41	1	0									9	6	14	8	37	102			7
78	Extinct Medical Schools	0	2																			1	0	0	1											1	0							7
79	Unapproved Schools							1	0	2	4	6	3											51	0	3	0													115	177			7
80	Totals	28		17		60		411		58		116		18		33		150		96		30		520		120		69		92		84		146		50		186		539		229		240	8
81	Totals—Examined—Passed	25		17		60		400		54		80		18		33		143		94		30		474		120		67		92		84		145		38		177		252		229		240	8
82	Totals—Examined—Failed	3		0		0		11		4		36		0		0		7		2		0		46		0		2		0		0		1		12		9		287		0		0	8
83	Percentage Failed	10.1		0.0		0.0		2.6		6.9		31.0		0.0		0.0		4.7		2.1		0.0		8.8		0.0		2.9		0.0		0.0		0.7		24.0		4.8		53.2		0.0		0.0	8
		1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16		17		18		19		20		21		22	

P = Passed; F = Failed.

(CONTINUED FROM PAGE 145)

nating, for instance, osteopaths in California and other states who obtain the legal right to special practice by the osteopathic board of the state.

There were 5,206 graduates of approved medical schools in the United States examined, of whom 4.6 per cent failed; 167 graduates of approved Canadian schools, 15.0 per cent of whom failed; 1,708 graduates of schools outside the United States and Canada, principally in Europe, with 59.6 per cent failures; 8 who graduated from medical schools extinct, of whom 50 per cent failed, and 422 from unapproved and osteopathic schools, of whom 46 per cent failed.

TABLE 5.—*Graduates of Medical Schools in Canada Examined for Licensure in the United States, 1941*

	Examined	Passed	Failed
Arizona	2	2	0
California	23	23	0
Connecticut	6	6	0
District of Columbia	1	1	0
Florida	2	1	1
Georgia	1	1	0
Illinois	7	6	1
Iowa	2	1	1
Louisiana	1	1	0
Maine	8	5	3
Maryland	5	5	0
Massachusetts	5	4	1
Michigan	3	3	0
Minnesota	12	12	0
Missouri	4	4	0
Montana	1	1	0
New Hampshire	8	7	1
New Jersey	4	4	0
New York	42	25	17
North Carolina	1	1	0
North Dakota	1	1	0
Ohio	2	2	0
Pennsylvania	11	11	0
Rhode Island	2	2	0
South Dakota	1	1	0
Tennessee	2	2	0
Vermont	1	1	0
Washington	6	6	0
West Virginia	1	1	0
Wisconsin	1	1	0
Hawaii	1	1	0
Totals	167	142	25

The 422 from unapproved and osteopathic schools represented 139 graduates of schools of osteopathy, of whom 85 passed and 54, or 38.8 per cent, failed and 283 graduates of unapproved schools, of whom 143 passed and 140, 49.5 per cent, failed. Graduates of osteopathic schools were examined by the medical boards of nine states, namely Colorado, Connecticut, Indiana, Massachusetts, New Jersey, Oregon, Texas, Virginia and Wisconsin, while graduates of unapproved medical schools were examined in four states and Hawaii. These states included California, Illinois, Massachusetts and Missouri.

Of the 139 osteopaths, 63 were examined in Massachusetts, 36 in New Jersey, 21 in Texas and 6 in Colorado. Other states examined fewer than 4.

Of the graduates of unapproved schools, Massachusetts examined 229 and Illinois 50. One candidate also was examined by the licensing boards in California, Missouri and Hawaii.

Osteopaths in Colorado, Massachusetts, New Jersey and Texas were examined in medicine and surgery, those in Oregon, Virginia and Wisconsin only in surgery, while Connecticut examined 1 each in medicine, surgery, and medicine and surgery.

The total number examined (7,511) do not represent individuals, since a candidate might take the examination in more than one state and would be counted in each state. This applies to those who pass or fail, or those who fail and later pass in one or more states or pass in one or more states and later in the same year fail elsewhere. However, if a candidate fails more than once in a given state within the year he is counted in that state only once as a failure.

Marginal Number	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50						
	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	Alaska, Hawaii and Puerto Rico	Totals	Examined—Passed	Examined—Failed	Percentage—Failed	No. Boards Examined by	Marginal Number
	P F	P F	P F	P F	P F	P F	P F	P F	P	F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F						
61																				63 1				1 0	1 0				70	69	1	1.4	5	61
62					1 1															85 3									100	96	4	4.0	7	62
63									0 1							1 0						11 0							15	14	1	6.7	5	63
64							1 0		1 0	5 0					5 0								63 0		4 0	1 0		2 0	91	91	0	0.0	11	64
65									1 0	1 0					1 0								32 0		1 0				61	61	0	0.0	9	65
66							2 0		5 4						1 0					1 0								51 0	75	70	5	6.7	9	63
67	1 0				1 0		1 0			1 0									1 0	3 0				1 0			27 0	54	53	1	1.9	17	67
68							2 0		9 5						1 0														17	12	5	29.4	3	68
69	1 0					2 0			0 2																1 0				9	6	3	33.3	6	69
70	1 0					5 0	1 0		6 4	1 0		1 0			5 0	1 0			1 0			1 0		3 0				1 0	60	55	5	8.3	22	70
71							1 0		0 1						1 0														7	6	1	14.3	7	71
72									0 1															1 0					3	2	1	33.3	3	72
73	1 0										1 0																		6	6	0	0.0	3	73
74						0 1			0 1							1 0													5	1	4	80.0	4	74
75	2 0								6 2						3 0			1 0	1 0					2 0		1 0			45	40	5	11.1	17	75
76									4 1			1 0			1 0														15	14	1	6.7	7	76
77			2 0			1 0	20	22	426	781		15	10			13	8	1 0			0 1	1 0	1 6	12	3	5 0			5	4	1,708	690	1,018	59.6	21	77
78												0 1				1 0												1 0	8	4	4	50.0	7	78
79	1 0						34	2												13 8				3 0				2 0	422	228	194	46.0	13	79
80	38	196	8	92	7	11	186	2	1,856	54	16	277	54	22	464	22	45	9	203	190	15	18	149	70	34	120	8	43	7,511	.....	.....	.....	..	80
81	38	196	7	92	5	10	157	2	888	54	15	263	54	22	446	22	45	9	199	177	15	18	146	69	34	120	8	37	.....	6,030	.....	.....	..	81
82	0	0	1	0	2	1	29	0	963	0	1	14	0	0	18	0	0	0	4	13	0	0	3	1	0	0	0	6	.....	.....	1,481	.....	..	82
83	0.0	0.0	12.5	0.0	28.6	10.0	15.6	0.0	52.2	0.0	6.3	5.1	0.0	0.0	3.9	0.0	0.0	0.0	2.0	6.8	0.0	0.0	2.0	1.4	0.0	0.0	0.0	14.0	.....	.....	.....	19.7	..	83
	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50						

Three of the five homeopathic boards in existence, Connecticut, Delaware and Maryland, examined 13 candidates, all of whom passed. The homeopathic boards in Arkansas and Louisiana did not examine any one in 1941. The one eclectic board in existence, in Arkansas, did not examine a candidate.

The greatest number of graduates of any one school examined was 174, representing the University of Illinois College of Medicine, who were examined in seventeen states. Of these, 5, 2.9 per cent, failed. The next greatest number, 165, were from the Hahnemann Medical College and Hospital of Philadelphia, examined in eighteen states. Thirty graduates of this school failed to pass the licensure examination, a percentage of 18.2. Only 1 of the 155 graduates of the University of Pennsylvania School of Medicine, who took the test in twenty-four states, failed.

Twenty medical schools in the United States had no failures before medical licensing boards, twenty-four less than 5 per cent, thirteen between 5 and 10 per cent and ten more than 10 per cent. The number examined from many of the schools having a high percentage of failures is small compared to the number of graduates annually from these schools. This is accounted for by the fact that the majority of their graduates take the examinations of the National Board of Medical Examiners. Table 10 includes figures and percentages of all examined during 1941, i. e. those who were examined by the National Board of Medical Examiners in their final examination as well as those passing state tests.

Graduates of Rush Medical College were examined in the greatest number of states, thirty-one, graduates of Northwestern University Medical School by twenty-eight states, Jefferson Medical College twenty-five, the University of Pennsylvania School of Medicine twenty-four and Loyola University School of Medicine twenty-one. All other schools had their graduates examined in fewer than twenty-one states. Graduates of Stanford, the University of California, Southern California, Georgia, Albany Medical College and Pittsburgh were examined in fewer than five states. The Albany Medical College had but 2 of its graduates examined for licensure in 1941, 1 each in Massachusetts and New York, both of whom were successful.

The source of candidates for licensure last year are further tabulated in table 3, giving totals for five groups, namely approved medical schools in the United States and in Canada, schools no longer in existence, schools of foreign countries and unapproved institutions. Of the United States schools 4.6 per cent failed and of the graduates of Canadian schools 15.0 per cent. The greatest percentage of failures represented two groups, foreign schools and unapproved schools. In these two groups 59.6 and 46.0 per cent, respectively, failed. Half of the 8 graduates of schools now extinct failed.

One hundred and sixty-seven graduates of nine approved medical schools in Canada took the test for medical licensure in the United States in 1941 in thirty states, the District of Columbia and Hawaii, of whom 142 passed and 25 failed. The greatest number (60) represented McGill University Faculty of Medicine, who were examined in twenty-two states and 45 graduates of the University of Toronto Faculty of Medicine in seventeen states, while 17 from Dalhousie University Faculty of Medicine applied for licensure in three states. The highest percentage of failures was 80, representing 5 graduates from the University of Montreal Faculty of Medicine examined in four states, only 1 of whom was successful. The state of New York examined 42 Canadian graduates, California 23, Minnesota 12 and Pennsylvania 11. All other states testing Canadian graduates

(CONTINUED ON PAGE 152)

Marginal Number	SCHOOL	1 Alabama P	F	2 Arizona P	F	3 Arkansas P	F	4 California P	F	5 Colorado P	F	6 Connecticut P	F	7 Delaware P	F	8 Dist. Columbia P	F	9 Florida P	F	10 Georgia P	F	11 Idaho P	F	12 Illinois P	F	13 Indiana P	F	14 Iowa P	F	15 Kansas P	F	16 Kentucky P	F	17 Louisiana P	F	18 Maine P	F	19 Maryland P	F	20 Massachusetts P	F	21 Michigan P	F	22 Minnesota P	F	Marginal Number
	ARKANSAS																																													
1	University of Arkansas School of Medicine					60	0											1	0																											1
	CALIFORNIA																																													
2	College of Medical Evangelists			2	0			55	1	3	0							1	0	1	0			1	0	2	0							1	0					6	0			2
3	Stanford University School of Medicine							53	2																																			3
4	University of California Medical School							51	0																																			4
5	University of Southern California Sch. of Med.			2	0			46	0																	1	0																	5
	COLORADO																																												
6	University of Colorado School of Medicine							3	0	39	0											2	0																	1	0	1	0	6
	CONNECTICUT																																												
7	Yale University School of Medicine											2	0					1	0																			1	0	1	0	2	0	1	0	7
	DISTRICT OF COLUMBIA																																												
8	George Washington University School of Med.	1	0	1	0			6	0			1	0			12	0					1	0			1	0											5	0							
9	Georgetown University School of Medicine							3	0			0	1			7	0	1	0																			3	0	2	0			1	0	9
10	Howard University College of Medicine	1	0									1	0			3	0			1	0			4	0													5	0							10
	GEORGIA																																												
11	Emory University School of Medicine	3	0															13	0	47	1																							1	0	11
12	University of Georgia School of Medicine																	3	0	37	0																									12
	ILLINOIS																																												
13	Loyola University School of Medicine			1	0			4	1	1	0	1	0					1	0					63	0	3	0	2	0									1	1	3	0	1	0	13
14	Northwestern University Medical School	1	0	1	0			8	1	2	0	1	0											53	0	3	0			3	0			2	0			1	0	1	0	11	0	13	0	14
15	University of Chicago, Rush Medical College	1	0	2	0			6	0	2	0	1	0					2	0			2	0	43	0	1	0					2	0	1	0	1	0	1	0	4	0	5	0	15
16	University of Chicago, The School of Medicine							4	0													1	0	16	0	1	0			1	0							1	0			2	0	2	0	16
17	University of Illinois College of Medicine							7	0									1	0			1	0	132	3	2	0													1	0	1	0	17
	INDIANA																																												
18	Indiana University School of Medicine							2	0																	98	0													1	0	1	0	1	0	18
	IOWA																																												
19	State University of Iowa College of Medicine			1	0			3	0	1	0							1	0					1	0			58	1											1	0	1	0	2	0	19
	KANSAS																																												
20	University of Kansas School of Medicine							3	0																					79	0													20
	KENTUCKY																																												
21	University of Louisville School of Medicine	2	0					1	0			2	0					4	0			1	0			2	0					74	0									1	0	21
	LOUISIANA																																												
22	Louisiana State University School of Medicine																					1	0											64	0							1	0	22
23	Tulane University of Louisiana Sch. of Med.	9	0	2	0							1	0					11	0											2	0	2	0	70	1					1	0	1	0	23
	MARYLAND																																												
24	Johns Hopkins University School of Medicine							2	0									2	0	1	0	1	0																	49	0			1	0	24
25	University of Maryland School of Medicine and College of Physicians and Surgeons											1	0	1	0			1	0													1	0					63	1			1	0	25
	MASSACHUSETTS																																												
26	Boston University School of Medicine							1	0																											1	0			2	0					26
27	Harvard Medical School							3	0			3	0					3	0																	4	0			12	0	4	0	2	0	27
28	Tufts College Medical School											2	1																							2	0			6	0					28
	MICHIGAN																																												
29	University of Michigan Medical School							2	0			1	0																													115	0	1	0	29
30	Wayne University College of Medicine													1	0			1	0																					1	0	54	0			30
	MINNESOTA																																												
31	University of Minnesota Medical School							5	0									2	0			1	0			1	0			1	0	1	0									4	0	108	0	31
	MISSOURI																																												
32	St. Louis University School of Medicine			1	0			3	0			2	0											1	0			1	0	1	0									2	0	2	0	32
33	Washington University School of Medicine	1	0					2	0									3	0																					2	0			33
	NEBRASKA																																												
34	Creighton University School of Medicine							13	1																															2	0	2	0	34
35	University of Nebraska College of Medicine							2	0			1	0									1	0					5	0			2	0							2	0	2	0	35
	NEW YORK																																												
36	Albany Medical College																																											36
37	Columbia University Coll. of Phys. and Surgs.							3	0			6	0					1	0	1	0															3	0							1	0	37
38	Cornell University Medical College											4	0					1	0																									38
39	Long Island College of Medicine											1	0					2	0																					1	0	1	0	39
40	New York Medical College, Flower and Fifth Avenue Hospitals											2	0																															40
41	New York University College of Medicine											2	0																			1	0											41
42	Syracuse University College of Medicine																																							1	0			42
43	University of Buffalo School of Medicine																	1	0																					1	0			43
44	University of Rochester School of Medicine and Dentistry							1	0															1	0									1	0			2	0			2	0	44
	NORTH CAROLINA																																												
45	Duke University School of Medicine																	2	0																	1	0					1	0	1	0	45
	OHIO																																												
46	Ohio State University College of Medicine																	1	0																									1	0	46
47	University of Cincinnati College of Medicine							1	0									1	0																					2	0			2	0	47
48	Western Reserve University School of Medicine																																												48
	OKLAHOMA																																												
49	University of Oklahoma School of Medicine							3	0	2	0	1	0									1	0																							49
	OREGON																																												
50	University of Oregon Medical School							9	0													2	0	1	0									1	0			1	0			4	0	50
	PENNSYLVANIA																																												
51	Hahnemann Medical Coll. and Hosp. of Phila.											3	0	2	0			2	0					2	0											1	1	8	0	3	4			1	0	51
52	Jefferson Medical College of Philadelphia	1	0					2	0					5	0	1	0	1	0	1	0			1	0											1	0	3	0	2	0	1	0			52
53	Temple University School of Medicine							3	0			1	0	2	0			6	0			1	0													1	0	2	0	1	0					53
54	University of Pennsylvania School of Medicine	2	0					3	0					1	0									2	0					2	0					3	0	5	0	4	0	6	0	2	0	54
55	University of Pittsburgh School of Medicine																	1	0																					1	0					55
56	Woman's Medical College of Pennsylvania	1	0									1	0																															56
	SOUTH CAROLINA																																												
57	Medical College of the State of South Carolina																	2	0																											57
	TENNESSEE																																												
58	Meharry Medical College																	3	0													1	0													58
59	University of Tennessee College of Medicine	2	0					2	0	1	0	1	0					3	0											1	0															59
60	Vanderbilt University School of Medicine											1	0					2	0																											60
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	

P = Passed; F = Failed.

Marginal Number	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	Alaska, Hawaii and Puerto Rico	Totals	Examined—Passed	Examined—Failed	Percentage—Failed	No. Boards Examined by	Marginal Number
	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F						
1									2 1		1 0																		65	64	1	1.5	4	1
2		1 0									1 0			5 0	3 0								6 0	1 0	1 0	1 0	2 0		93	92	1	1.1	17	2
3																												1 0	57	55	2	3.5	3	3
4																													51	51	0	0.0	1	4
5																													49	49	0	0.0	3	5
6																1 0										1 0			48	48	0	0.0	7	6
7		1 0					1 0					1 0																	11	11	0	0.0	9	7
8							1 0		2 2						3 0				1 0			1 0 1 0 1 0				1 0			41	39	2	4.9	16	8
9							11 0		13 5 3 0						6 0 2 0								1 0						59	53	6	10.2	13	9
10									1 0			1 0			2 0				2 0				6 0		2 0				29	29	0	0.0	12	10
11	1 0								1 0	2 0							1 0												70	69	1	1.4	8	11
12	1 0																												41	41	0	0.0	3	12
13	1 0						4 0		6 3			2 0			1 0								5 0		2 0	1 0	1 0		109	104	5	4.8	20	13
14	1 0 8 0						1 0 1 0		1 1	3 0	4 0				1 0						2 0		3 0	1 0	8 0				136	134	2	1.5	25	14
15	1 0					1 0			5 2	2 0	2 0				1 0			2 0		2 0	8 0		3 0	1 0	5 0				110	108	2	1.8	28	15
16							1 0					1 0			3 0								1 0						35	35	0	0.0	13	16
17	1 0				1 0				1 0					1 0						1 0			2 0		7 0		2 0		164	161	3	1.8	15	17
18									1 0						2 0														106	106	0	0.0	7	18
19																						1 0 1 0							72	71	1	1.4	11	19
20	1 0											2 0											1 0						86	86	0	0.0	5	20
21							1 0		6 0						1 0								2 0	1 0	2 0	1 0			101	101	0	0.0	15	21
22	4 0								2 1						1 0							1 0					1 0		76	75	1	1.3	8	22
23	13 0						1 0		1 0 1 0								2 0			2 0		1 0		1 0			2 0		125	124	1	0.8	19	23
24	1 0														2 0														63	63	0	0.0	9	24
25									1 0	4 0					2 0								3 0				2 0		81	80	1	1.2	11	25
26									3 1							1 0													9	8	1	11.1	5	26
27									5 3	1 0		2 0			1 0								1 0						44	41	3	6.8	12	27
28						1 0	2 0									3 0													17	16	1	5.9	6	28
29									2 1		1 0				1 0												1 0		125	124	1	0.8	8	29
30									0 1																				58	57	1	1.7	5	30
31									1 0	4 0					1 0			1 0					2 0		3 0		2 0		137	137	0	0.0	15	31
32	76 0								11 4						3 0	1 0				1 0			1 0				1 0		111	107	4	3.6	15	32
33	1 0 91 0																			1 0	1 0		2 0						104	104	0	0.0	9	33
34			21 0				1 0		1 3			2 0											3 0				1 0		57	53	4	7.0	11	34
35	1 0		68 0						0 1						2 0											1 0			77	76	1	1.3	8	35
36									1 0																				1	1	0	0.0	1	36
37							5 0		64 8			1 0 1 0				1 0						1 0		1 0					97	89	8	8.2	13	37
38							1 0		40 6	1 0		1 0			2 0												1 0		59	53	6	10.2	10	38
39	1 0						3 1		50 17	1 0					1 0				0 1										79	60	19	24.1	9	39
40							3 0		3 2																				10	8	2	20.0	3	40
41	1 0						10 0		83 20			1 0																	118	98	20	16.9	6	41
42									26 12						2 0														41	29	12	29.3	3	42
43	1 0								13 4																				20	16	4	20.0	4	43
44									18 13			5 0			1 0														46	33	13	28.3	9	44
45										2 0												1 0							8	8	0	0.0	6	45
46											69 1				1 0												0 1		74	72	2	2.7	5	46
47											72 2						1 0						1 0						82	80	2	2.4	7	47
48											60 0				1 0														61	61	0	0.0	2	48
49	1 0									1 0	51 0								2 0				1 0			1 0			64	64	0	0.0	10	49
50									1 0					11 0									11 0				2 0		43	43	0	0.0	10	50
51							19 1		3 15	1 0		12 0			71 7	1 0								1 0	1 0		2 0		161	133	28	17.4	17	51
52	3 0						9 0		2 1	10 0		4 0			75 0	2 0	1 0					1 0		3 0					130	129	1	0.8	21	52
53							8 1		8 5	6 0					64 2				1 0	2 0	1 0		1 0		2 0	2 0			120	112	8	6.7	18	53
54							6 1		7 0	6 0					79 0				1 0	2 0	1 0			2 0					135	134	1	0.7	18	54
55															44 0														46	46	0	0.0	3	55
56									1 0						9 0														13	13	0	0.0	5	56
57										3 0					2 0		39 0												46	46	0	0.0	4	57
58									0 2						1 1				48 0										56	53	3	5.4	5	58
59	15 0						1 0								1 0				90 3										120	117	3	2.5	10	59
60	1 0								1 0	1 0									52 0										58	58	0	0.0	6	60

Marginal Number	SCHOOL	1 Alabama P	F	2 Arizona P	F	3 Arkansas P	F	4 California P	F	5 Colorado P	F	6 Connecticut P	F	7 Delaware P	F	8 Dist. Columbia P	F	9 Florida P	F	10 Georgia P	F	11 Idaho P	F	12 Illinois P	F	13 Indiana P	F	14 Iowa P	F	15 Kansas P	F	16 Kentucky P	F	17 Louisiana P	F	18 Maine P	F	19 Maryland P	F	20 Massachusetts P	F	21 Michigan P	F	22 Minnesota P	F	Marginal Number
	TEXAS																																													
61	Baylor University College of Medicine	..	..	..	..	..	..	2	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	61
62	University of Texas Medical Branch	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	3	0	62
	VERMONT																																													
63	University of Vermont College of Medicine	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	63
	VIRGINIA																																													
64	Medical College of Virginia	..	..	..	..	..	..	2	0	..	..	..	..	..	..	..	..	2	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	64
65	University of Virginia Department of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	65
	WISCONSIN																																													
66	Marquette University School of Medicine	..	..	..	..	..	..	4	0	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	0	3	0	66
67	University of Wisconsin Medical School	..	1	0	..	5	0	1	0	..	..	..	..	..	..	..	..	1	0	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	1	0	5	0	67
	CANADA																																													
68	Dalhousie University Faculty of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	68
69	Laval University Faculty of Medicine	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	69
70	McGill University Faculty of Medicine	..	1	0	..	10	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	0	..	..	3	0	1	0	70
71	Queen's University Faculty of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	71
72	University of Alberta Faculty of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	72
73	University of Manitoba Faculty of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	0	73
74	University of Montreal Faculty of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	2	..	..	..	..	..	..	..	..	74
75	University of Toronto Faculty of Medicine	..	1	0	..	10	0	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	75
76	University of Western Ontario Medical School	..	..	..	..	..	..	..	..	2	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	76
77	Foreign Medical Faculties	..	..	..	..	..	..	2	0	..	..	..	..	..	..	..	..	..	..	9	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	1	1	..	..	..	..	77
78	Unapproved Schools	..	..	..	..	..	..	..	..	2	3	..	..	..	..	..	..	..	..	50	0	..	..	..	..	..	..	3	0	..	..	..	..	..	..	..	..	..	..	..	..	85	95	..	..	..	..	78
79	Totals	25		16		69		358		57		51		13		23		85		90		16		389		118		69		91		84		143		24		155		232		236		183		79
80	Totals—Examined—Passed	25		16		69		352		54		48		13		23		85		89		16		381		118		67		91		84		142		20		153		131		236		183		80
81	Totals—Examined—Failed	0		0		0		6		3		3		0		0		0		1		0		8		0		2		0		0		1		4		2		101		0		0		81
82	Percentage Failed	0.0		0.0		0.0		1.7		5.3		5.9		0.0		0.0		0.0		1.1		0.0		2.1		0.0		2.9		0.0		0.0		0.7		16.7		1.3		43.5		0.0		0.0		82
		1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16		17		18		19		20		21		22		

P = Passed; F = Failed.

(CONTINUED FROM PAGE 149)

examined less than 10, and nineteen states and Hawaii fewer than 5. Seventeen of the total number of failures (25) were unsuccessful in the examination of the New York Board of Medical Examiners.

Twenty states examined 1,708 graduates of medical schools other than those in the United States and Canada. One took the test in Alaska and 4 in Puerto Rico. In 1941 also 422 unapproved graduates were examined in four states and Hawaii.

Forty-three candidates were examined in Alaska, Hawaii and Puerto Rico, 37 of whom passed and 6 failed. Of these 19 were tested in Hawaii with 1 failure, 18 in Puerto Rico with 5 failures, and 6 were examined in Alaska and passed.

Altogether in 1941 there were 7,511 examined, of whom 6,030 passed and 1,481, or 19.7 per cent, failed.

The number so examined in 1941 was a decrease of 410 from the number examined in 1940, likewise a decrease of 252 among successful returns and a decrease of 158 among those who failed. The number of graduates of foreign medical schools examined in 1941 was considerably fewer than the previous years. It may be assumed also that a small number of recent graduates entered the military services of the country before securing state licensure.

Elsewhere are given figures referring to actual licentiates and additions to the medical profession.

GRADUATES OF 1939, 1940 and 1941 EXAMINED FOR MEDICAL LICENSURE

Figures recording graduates of 1939, 1940 and 1941 examined for medical licensure in 1941 are presented in table 6. Altogether, 5,309 were examined, of whom 4,916 passed and 393, or 7.4 per cent, failed. Represented were 4,740 graduates of sixty-seven medical schools of the United States. From the nine approved medical schools in Canada which offer the complete course, 104 were examined. There were 190 recent graduates of medical schools of countries other than the United States and Canada, and 275 graduates of unapproved schools.

Combined totals for the graduates of the three years for each of these groups, recording the number examined, passed and failed, are given in table 7.

Of the medical schools in the United States 3.9 per cent failed, while among the graduates of Canadian schools 14.4 per cent, those holding foreign diplomas 46.8 per cent and unapproved schools 37.5 per cent.

Twenty-six schools in the United States had no failures among recent graduates applying for licensure, twenty-four had less than 5 per cent and seventeen more than 5 and ranging to 29.3 per cent, five schools having failure percentages of 20 or more.

TABLE 7.—*Source of Graduates of 1939, 1940 and 1941 Examined, 1941*

Medical Schools	Examined	Passed	Failed	Percentage Failed
Approved, in United States	4,740	4,554	186	3.9
Approved, in Canada	104	89	15	14.4
Foreign	190	101	89	46.8
Unapproved	275	172	103	37.5
Totals	5,309	4,916	393	7.4

New York examined the greatest number of recent graduates, 697; then came Pennsylvania with 416, Illinois with 389, California with 358 and Ohio with 246. More than 100 from each of seventeen schools were examined, the highest being 164 graduates of the University of Illinois College of Medicine, who appeared before licensing boards in fifteen states. Forty graduates of McGill University Faculty of Medicine, the greatest number from any one Canadian medical school, were tested in seventeen states, while only 1 graduate from the University of Alberta Faculty of Medicine

Marginal Number	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	Alaska, Hawaii and Puerto Rico	Totals	Examined—Passed	Examined—Failed	Percentage—Failed	No. Boards Examined by	Marginal Number
	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F						
61	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	61 1	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	67	66	1	1.5	3	61
62	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	85 3	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	93	90	3	3.2	4	62
63	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	11 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	14	14	0	0.0	4	63
64	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	1 0	5 0	.. ..	.. ..	.. ..	.. ..	4 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	61 0	.. ..	4 0	1 0	.. ..	1 0	82	82	0	0.0	10	64
65	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	52 0	.. ..	1 0	.. ..	.. ..	.. ..	56	56	0	0.0	5	65
66	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2 0	.. ..	5 4	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	51 0	.. ..	.. ..	75	70	5	6.7	9	66
67	.. ..	1 0	.. ..	.. ..	1 0	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	3 0	.. ..	.. ..	.. ..	1 0	.. ..	25 0	.. ..	.. ..	48	48	0	0.0	14	67
68	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2 0	.. ..	8 5	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	16	11	5	31.3	3	68
69	.. ..	1 0	.. ..	.. ..	.. ..	2 0	.. ..	.. ..	0 2	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	9	6	3	33.3	6	69
70	.. ..	1 0	.. ..	.. ..	.. ..	5 0	1 0	.. ..	3 1	1 0	.. ..	.. ..	.. ..	.. ..	4 0	1 0	.. ..	.. ..	1 0	.. ..	.. ..	1 0	.. ..	3 0	.. ..	.. ..	.. ..	1 0	40	39	1	2.5	17	70
71	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	0 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	3	2	1	33.3	3	71
72	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	1	1	0	0.0	1	72
73	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	4	4	0	0.0	2	73
74	.. ..	.. ..	.. ..	.. ..	.. ..	0 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	4	1	3	75.0	3	74
75	.. ..	2 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2 1	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	21	19	2	9.5	8	75
76	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	3 0	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	6	6	0	0.0	3	76
77	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	10 5	.. ..	69 70	.. ..	.. ..	2 0	.. ..	.. ..	1 3	.. ..	.. ..	.. ..	.. ..	0 1	.. ..	.. ..	1 0	1 0	.. ..	.. ..	.. ..	3 3	190	101	89	46.8	13	77
78	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	15 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2 0	.. ..	.. ..	.. ..	.. ..	.. ..	10 4	.. ..	.. ..	3 0	.. ..	.. ..	2 0	.. ..	.. ..	275	172	103	37.5	9	78
79	37	194	2	89	2	11	132	1	697	51	10	246	52	21	416	14	44	4	200	183	14	14	129	54	27	114	6	27	5,309	.....	.....	.....	..	79
80	37	194	2	89	2	10	122	1	479	51	10	243	52	21	403	14	44	4	196	174	14	14	129	54	27	114	6	23	.....	4,916	.....	.....	..	80
81	0	0	0	0	0	1	10	0	218	0	0	3	0	0	13	0	0	0	4	9	0	0	0	0	0	0	0	4	.....	.....	393	.....	..	81
82	0.0	0.0	0.0	0.0	0.0	9.1	7.6	0.0	31.3	0.0	0.0	1.2	0.0	0.0	3.1	0.0	0.0	0.0	2.0	4 9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.8	.....	.....	...	7.4	..	82
	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50						

appeared for registration. Only 11 of the graduates of Yale University School of Medicine of 1939, 1940 and 1941 were examined last year in nine states. Very few also of the recent graduates of Boston University School of Medicine, Tufts College Medical School, the New York Medical College, Flower and Fifth Avenue Hospitals and Duke University School of Medicine applied for licensure by this method and only 1 from Albany Medical College. The majority of the graduates of these schools with few examinees before state licensing boards obtained the certificate of the National Board of Medical Examiners and receive state licenses to practice medicine by endorsement of this certificate.

TABLE 8.—*Source of Graduates of 1939, 1940 and 1941, Respectively, Examined for Medical Licensure, 1941*

Medical Schools	1939 Passed	1939 Failed	1940 Passed	1940 Failed	1941 Passed	1941 Failed
Approved, in United States	431	29	1,062	64	3,061	93
Approved, in Canada	23	4	52	7	14	4
Foreign	47	49	45	38	9	2
Unapproved	28	21	45	47	99	35
Totals	529	103	1,204	156	3,183	134

The data enumerated in table 6 are subdivided by years in table 8, giving totals, passed and failed, for the graduates of 1939, 1940 and 1941 respectively of (*a*) approved medical schools in the United States, (*b*) approved medical schools in Canada, (*c*) foreign faculties of medicine and (*d*) unapproved schools and schools of osteopathy. Of the graduates of 1939, 529 passed. In 1940, 1,204 and 1941, 3,183 were successful. The failures of graduates of these three years were respectively 103, 156 and 134.

Table 9 gives the totals of all groups, segregated by year of graduation, examined and the results for each year.

Of the total number of examinees for licensure in the United States in 1941, 70.7 per cent were graduates of 1939, 1940 and 1941. Of those graduates prior to 1939, 49.4 per cent failed, whereas only 7.4 per cent of the recent graduates of all schools failed.

CONSOLIDATED EXAMINATIONS

In table 10 are presented for each approved medical school in the United States and Canada the number of graduates examined in 1941 for medical licensure and the number who appeared for part III, the final examination of the National Board of Medical Examiners, in 1941. In some instances schools having a high percentage of failures before licensing boards had few, if any, failures before the National Board.

During the year 5,206 graduates of approved medical schools in the United States were examined by medical licensing boards, of whom 4.6 per cent failed, while in the consolidated figures 6,042 were examined and 4.3 per cent failed.

Of the Canadian schools, 15.0 per cent failed state board tests and 14.8 per cent the combined tests. Only 58 graduates of foreign faculties of medicine took the final test of the National Board of Medical Examiners, while 1,708 were examined by state licensing boards. The National Board does not admit to its examination graduates of other than approved medical schools.

TABLE 9.—*Graduates of 1939, 1940, 1941, Respectively, Examined, 1941*

Graduates of	Examined	Passed	Failed	Percentage Failed
1939	632	529	103	16.3
1940	1,360	1,204	156	11.5
1941	3,317	3,183	134	4.0
Totals	5,309	4,916	393	7.4

TABLE 10.—*Consolidated Examinations, State Medical Examining Boards and the National Board of Medical Examiners, 1941*

School	Examined by Medical Examining Boards P	Examined by Medical Examining Boards F	Part III of Examination of National Board of Medical Examiners P	Part III of Examination of National Board of Medical Examiners F	Totals P	Totals F	Totals %F
Univ. of Arkansas	67	4	1	1	68	5	6.8
Coll. of Medical Evangelists	94	1	46	1	140	2	1.4
Stanford Univ.	55	2	3	0	58	2	3.3
Univ. of California	51	0	1	0	52	0	0.0
Univ. of Southern California	50	0	1	0	51	0	0.0
Univ. of Colorado	49	0	6	0	55	0	0.0
Yale Univ.	16	0	34	0	50	0	0.0
George Washington Univ.	49	3	10	0	59	3	4.8
Georgetown Univ.	60	10	36	3	96	13	11.9
Howard Univ.	30	1	2	0	32	1	3.0
Emory Univ.	72	2	1	0	73	2	2.7
Univ. of Georgia	42	0	1	0	43	0	0.0
Loyola Univ.	112	5	3	0	115	5	4.2
Northwestern Univ.	146	3	25	0	171	3	1.7
Rush Medical Coll.	125	3	5	0	130	3	2.3
Univ. of Chicago, Sch. of Med.	42	0	11	0	53	0	0.0
Univ. of Illinois	169	5	5	0	174	5	2.8
Indiana Univ.	109	0	2	0	111	0	0.0
State Univ. of Iowa	72	1	8	1	80	2	2.4
Univ. of Kansas	89	0	..	..	89	0	0.0
Univ. of Louisville	106	0	..	..	106	0	0.0
Louisiana State Univ.	75	1	3	0	78	1	1.3
Tulane Univ.	129	1	5	0	134	1	0.7
Johns Hopkins Univ.	78	0	8	0	86	0	0.0
Univ. of Maryland	84	2	1	0	85	2	2.3
Boston Univ.	10	4	39	1	49	5	9.3
Harvard Medical Sch.	91	6	67	0	158	6	3.7
Tufts Coll. Med. Sch.	28	3	80	2	108	5	4.4
Univ. of Michigan	130	2	7	0	137	2	1.4
Wayne Univ.	57	1	..	..	57	1	1.7
Univ. of Minnesota	142	2	13	0	155	2	1.3
St. Louis Univ.	111	5	15	0	126	5	3.8
Washington Univ.	118	1	5	0	123	1	0.8
Creighton Univ.	59	6	4	0	63	6	8.7
Univ. of Nebraska	92	3	..	..	92	3	3.2
Albany Med. Coll.	2	0	32	0	34	0	0.0
Columbia Univ.	105	11	14	0	119	11	8.5
Cornell Univ.	64	8	19	0	83	8	8.8
Long Island Coll. of Med.	65	19	21	1	86	20	18.9
New York Med. Coll.	11	3	58	5	69	8	10.4
New York Univ.	110	20	23	0	133	20	13.1
Syracuse Univ.	34	12	2	0	36	12	25.0
Univ. of Buffalo	19	4	55	1	74	5	6.3
Univ. of Rochester	39	13	10	0	49	13	21.0
Duke Univ.	14	0	59	0	73	0	0.0
Ohio State Univ.	75	4	..	..	75	4	5.1
Univ. of Cincinnati	86	3	1	0	87	3	3.3
Western Reserve Univ.	65	0	1	0	66	0	0.0
Univ. of Oklahoma	65	0	2	0	67	0	0.0
Univ. of Oregon	48	0	2	0	50	0	0.0
Hahnemann Medical Coll.	135	30	..	..	135	30	18.2
Jefferson Med. Coll.	144	3	8	1	152	4	2.6
Temple Univ.	117	8	8	1	125	9	6.7
Univ. of Pennsylvania	154	1	14	0	168	1	0.6
Univ. of Pittsburgh	48	0	1	0	49	0	0.0
Woman's Medical Coll.	15	1	8	1	23	2	8.0
Medical Coll. of South Carolina	47	0	1	0	48	0	0.0
Meharry Medical Coll.	53	4	..	..	53	4	7.0
Univ. of Tennessee	126	7	..	..	126	7	5.3
Vanderbilt Univ.	62	0	..	..	62	0	0.0
Baylor Univ.	69	1	..	..	69	1	1.4
Univ. of Texas	96	4	..	..	96	4	4.0
Univ. of Vermont	14	1	18	1	32	2	5.9
Medical Coll. of Virginia	91	0	2	0	93	0	0.0
Univ. of Virginia	61	0	1	0	62	0	0.0
Marquette Univ.	70	5	8	0	78	5	6.0
Univ. of Wisconsin	53	1	..	..	53	1	1.9
Totals: U. S. Schools	**4,966**	**240**	**816**	**20**	**5,782**	**260**	**4.3**
Dalhousie Univ.	12	5	..	..	12	5	29.4
Laval Univ.	6	3	..	..	6	3	33.3
McGill Univ.	55	5	12	2	67	7	9.5
Queen's Univ.	6	1	..	..	6	1	14.3
Univ. of Alberta	2	1	..	..	2	1	33.3
Univ. of Manitoba	6	0	..	..	6	0	0.0
Univ. of Montreal	1	4	..	..	1	4	80.0
Univ. of Toronto	40	5	1	0	41	5	10.9
Univ. of Western Ontario	14	1	1	0	15	1	6.3
Totals: Canadian Schools	**142**	**25**	**14**	**2**	**156**	**27**	**14.8**
Foreign Medical Faculties	690	1,018	55	3	745	1,021	57.8
Extinct Medical Schools	4	4	..	..	4	4	50.0
Unapproved Schools	228	194	..	..	228	194	46.0
Totals	**6,030**	**1,481**	**885**	**25**	**6,915**	**1,506**	**17.9**

P=Passed; F=Failed.

The total of all examined before medical licensing boards was 7,511, of whom 6,030 passed and 1,481, or 19.7 per cent, failed. For both groups 8,421 were examined; 6,915 passed and 1,506, or 17.9 per cent, failed. The total percentage of failures has been slightly reduced by including figures for the National Board but materially so for certain schools. Twenty-one schools had no failures in either group.

TABLE 11.—*Licensure Failures by Graduates of Schools Located in the State Where Examined and Elsewhere, 1941*

	Total No. Examined	No. Failures of Schools in State	No. Schools in State Represented	Per Cent Failed	No. Failures of Schools Out of State	No. Schools Out of State Represented	Per Cent Failed	Total Per Cent Failed in All U. S. Schools
Arkansas	60	0	1	0.0	0	0		0.0
California	348	3	4	1.4	4	36	2.9	2.0
Colorado	52	0	1	0.0	0	8	0.0	0.0
Connecticut	66	0	1	0.0	5	30	7.9	7.6
Dist. Columbia	32	0	3	0.0	0	7	0.0	0.0
Georgia	95	1	2	1.2	1	10	10.0	2.1
Illinois	342	3	5	0.9	0	16	0.0	0.9
Indiana	116	0	1	0.0	0	11	0.0	0.0
Iowa	67	1	1	1.7	0	3	0.0	1.5
Kansas	92	0	1	0.0	0	9	0.0	0.0
Kentucky	84	0	1	0.0	0	7	0.0	0.0
Louisiana	145	1	2	0.7	0	9	0.0	0.7
Maryland	159	1	2	0.9	0	17	0.0	0.6
Massachusetts	103	0	3	0.0	7	27	12.5	6.8
Michigan	236	0	2	0.0	0	27	0.0	0.0
Minnesota	228	0	1	0.0	0	45	0.0	0.0
Missouri	191	0	2	0.0	0	15	0.0	0.0
Nebraska	92	0	2	0.0	0	1	0.0	0.0
New York	607	86	9	21.8	84	43	39.4	28.0
North Carolina	53	0	1	0.0	0	18	0.0	0.0
Ohio	249	3	3	1.5	0	17	0.0	1.2
Oklahoma	54	0	1	0.0	0	3	0.0	0.0
Oregon	20	0	1	0.0	0	4	0.0	0.0
Pennsylvania	431	9	6	2.5	1	34	1.5	2.3
South Carolina	45	0	1	0.0	0	5	0.0	0.0
Tennessee	201	3	3	1.6	1	7	12.5	2.0
Texas	168	4	2	2.6	0	9	0.0	2.4
Vermont	16	0	1	0.0	0	5	0.0	0.0
Virginia	131	0	2	0.0	0	9	0.0	0.0
Wisconsin	117	0	2	0.0	0	16	0.0	0.0
	States Without Medical Schools							
Alabama	26				1	13	3.9	3.9
Arizona	15				0	11	0.0	0.0
Delaware	18				0	8	0.0	0.0
Florida	148				6	48	4.1	4.1
Idaho	28				0	19	0.0	0.0
Maine	26				3	11	11.5	11.5
Mississippi	38				0	8	0.0	0.0
Montana	5				1	5	20.0	20.0
Nevada	7				2	6	28.6	28.6
New Hampshire	2				0	2	0.0	0.0
New Jersey	104				5	24	4.8	4.8
New Mexico	2				0	2	0.0	0.0
North Dakota	15				1	7	6.7	6.7
Rhode Island	19				0	12	0.0	0.0
South Dakota	8				0	6	0.0	0.0
Utah	14				0	6	0.0	0.0
Washington	59				1	23	1.7	1.7
West Virginia	33				0	21	0.0	0.0
Wyoming	7				0	6	0.0	0.0
Alaska, Hawaii and Puerto Rico	32				2	21	6.2	6.2

FAILURES BEFORE MEDICAL EXAMINING BOARDS BY LICENTIATES

The number licensed after failing a state licensing examination once and after two or more failures, these two groups being classified by indication whether the failure or failures have been in the state in which they are receiving a license or elsewhere and also if the failure has been in the state where licensed and elsewhere, are presented in table 12. These two divisions are given for three groups of candidates, namely graduates of approved medical schools, foreign faculties of medicine and unapproved institutions. The total number of candidates examined and licensed or granted licenses by endorsement or reciprocity in each state is also shown.

Of the 8,756 licentiates in 1941, 686 had previously been unsuccessful before a licensing board. Of the approved schools 130 were licensed after one failure in the state where licensed, and 43 licensed after one failure elsewhere. Fifty-four received licenses after more than one failure, of whom 37 received licenses in the state of their previous failures, 16 received licenses after more than 1 failure in other states. One candidate was licensed in Hawaii after failing in Hawaii and before three state boards.

majority of these physicians were Massachusetts and New York examinees. There was 1 graduate of an approved school in the United States who made fourteen attempts in New York before registration.

Seventeen states licensed in 1941 only physicians who never failed a state board examination, while New York licensed 417 who had failed previously. With the exception of California, Illinois, Massachusetts, New Jersey, Ohio and Pennsylvania, no state licensed more than 8 such candidates.

TABLE 12.—*Failures Before Medical Licensing Boards by Licentiates, 1941*

		Approved Schools					Foreign Schools					Unapproved Schools					
		Licensed After One Failure		Licensed After Two or More Failures			Licensed After One Failure		Licensed After Two or More Failures			Licensed After One Failure		Licensed After Two or More Failures			
	Licenses Issued by Examination, Reciprocity or Endorsement	Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed and Elsewhere	Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed and Elsewhere	Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed and Elsewhere	Total Failures by Licentiates, 1941
Alabama	87	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1
Arizona	36	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Arkansas	83	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1
California	630	12	2	6	1	..	..	1	2	3	..	..	..	..	..	..	27
Colorado	88	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Connecticut	139	3	..	1	1	..	..	..	2	..	..	..	..	..	..	..	7
Delaware	22	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1
District of Columbia	100	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Florida	143	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	3
Georgia	130	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Idaho	29	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Illinois	581	4	..	..	..	..	10	2	7	1	1	..	1	1	..	..	27
Indiana	217	..	1	..	..	..	..	1	..	..	..	..	..	..	..	..	2
Iowa	113	..	1	..	..	..	..	..	..	2	..	..	..	..	..	..	3
Kansas	114	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Kentucky	127	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Louisiana	157	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Maine	67	4	..	1	..	..	1	1	..	1	..	..	..	..	..	..	8
Maryland	203	..	1	..	..	..	..	2	..	1	..	..	..	..	..	..	4
Massachusetts	349	..	3	4	..	..	..	2	10	5	4	15	..	39	..	2	84
Michigan	414	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	3
Minnesota	269	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Mississippi	75	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Missouri	279	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	2
Montana	27	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Nebraska	105	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Nevada	16	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2
New Hampshire	44	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	2
New Jersey	262	4	5	..	4	..	..	..	2	2	8	..	..	..	..	..	25
New Mexico	31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
New York	1,173	88	..	25	..	..	104	5	157	1	37	..	..	..	..	..	417
North Carolina	119	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
North Dakota	25	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1
Ohio	409	..	1	..	..	..	3	2	..	5	5	..	..	..	..	..	16
Oklahoma	93	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	2
Oregon	54	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Pennsylvania	539	12	7	..	1	..	3	2	..	..	..	..	..	..	..	..	25
Rhode Island	35	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1
South Carolina	62	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
South Dakota	15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Tennessee	256	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	2
Texas	290	1	1	..	1	..	..	..	..	..	..	..	..	..	..	..	3
Utah	27	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Vermont	32	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	2
Virginia	217	..	..	..	..	..	1	2	..	1	..	..	..	..	..	..	4
Washington	129	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	2
West Virginia	93	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1
Wisconsin	172	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	2
Wyoming	20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Alaska, Hawaii, Puerto Rico	59	..	1	..	1	1	..	..	..	..	..	1	..	..	..	..	4
Totals	8,756	130	43	37	16	1	122	20	180	22	56	16	1	40	0	2	686

Four hundred graduates of foreign faculties were licensed after previous failure and 59 graduates of unapproved institutions.

In the computation of these statistics it was noted that 57 licentiates had failed five or more times. Of these 22 had five failures before obtaining a license, 10 had six, 9 failed seven examinations, 3 individuals failed eight and nine times, 2 failed ten, 2 failed eleven and 2 failed fourteen tests. Noteworthy were 4 candidates from unapproved medical schools licensed in Massachusetts, 1 each after sixteen, seventeen, twenty-three and twenty-five unsuccessful attempts. The great

In another table presented in this group (table 11) are recorded data referring to the number who failed state board examinations and were graduates of a medical school located in the state in which they were examined and by comparison the number of graduates licensed in the state who obtained their medical training in schools in other states. It is particularly significant that in New York State 21.8 per cent of those who studied medicine in the nine schools in that state and who appeared for licensure in 1941 failed, while a much higher percentage, 39.4, who obtained their medical training in forty-three schools located in other

states failed. On the other hand, as can be noted in table 23, the licensing boards of seven states, namely Arkansas, Nebraska, North Carolina, Oklahoma, Oregon, Utah and Wisconsin, had no failures in five years. In five years also twelve states reported failures of less than 1 per cent. In some of these states an applicant must receive an average of at least 75 per cent and not fall below 50 per cent in any one subject. In case of failure in not more than two subjects the applicant is entitled to another examination in those subjects within twelve months. Those so failing are not reported to the office of the Council as failures.

REGISTRATION BY RECIPROCITY AND ENDORSEMENT

A compilation of data furnished by medical examining boards regarding their reciprocity and endorsement policies are presented in table 13. Included are data pertaining to all states, the District of Columbia, Alaska, Hawaii and Puerto Rico. Definite reciprocal relations are reported by twenty-six states and Alaska. Twenty-three states, including five that have regularly established reciprocal relations, will register licentiates who present credentials which correspond to those required by their respective states at the time such licenses were

TABLE 13.—*Reciprocity and*

Marginal Number	The Examining Board of	Reciprocates with, or Endorses Certificates Granted by																														Marginal Number
		Alabama	Arizona	Arkansas	California	Colorado	Connecticut	Delaware	Dist. of Columbia	Florida	Georgia	Idaho	Illinois	Indiana	Iowa	Kansas	Kentucky	Louisiana	Maine	Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	
1	Alabama	..	..	+	+	+	..	+	+	+	+	..	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	..	+	+	+	1
2	Arizona	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2
3	Arkansas (regular board)	+	+	..	+	+	..	..	+	..	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	+	+	..	+	+	3
4	California	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4
5	Colorado	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5
6	Connecticut (reg. & homeo. bds.)	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6
7	Delaware (regular board)	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7
8	District of Columbia	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	8
9	Florida	No reciprocity or endorsement policies											..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9
10	Georgia	+	..	+	+	+	..	..	+	..	..	..	..	+	+	+	+	+	+	+	..	+	+	+	+	..	+	+	+	+	+	+	10
11	Idaho	No reciprocal relations							..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	11
12	Illinois	+	..	+	+	+	..	..	..	..	..	..	..	+	+	+	+	+	+	+	..	+	+	+	+	..	+	+	+	+	+	..	12
13	Indiana	+	..	+	+	+	..	..	+	..	+	..	+[32]	..	+	+	+	+	+	+	..	+	..	+	+	..	+	+	+	+	+	+	13
14	Iowa	+	..	+	+	+	..	+	+	..	+	..	+	+	..	+	+	+	+	+	..	+	..	+	+	+	+	+	+	+	+	+	14
15	Kansas	+	+	+[19]	+	..	..	+	+	..	+	..	+	+	+	..	+	+	+	+	..	+	..	+	+	+	+	+	+	+	+	+	15
16	Kentucky	+	..	+	+	+	..	+	+	..	+	..	+	+	+	+	..	+	..	+	..	+	+	+	..	+	+	+	+	+	+	+	16
17	Louisiana (reg. & homeo. bds.)	+	+	+	+	+	..	+	+	..	+	..	+	+	+	+	+	..	+	+	..	+	+	+	+	..	+	+	+	+	+	+	17
18	Maine	..	..	+	+	+	..	+	+	..	+	..	+	+	+	+	+	+	..	+	..	+	+	..	+	+	+	+	..	+	+	+	18
19	Maryland (reg. & homeo. bds.)	+	..	+	+	..	..	..	+	..	+	..	+	+	+	+	+	+	..	..	..	+	+	+	+	+	+	+	+	+	+	+	19
20	Massachusetts	No reciprocal relations							..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	20
21	Michigan	+	+	+	+	+	+	+	+	..	+	..	+	+	+	+	+	+	+	+	..	..	+	+	+	+	+	+	+	+	+	+	21
22	Minnesota	+	..	+	+	..	..	+	..	..	+	..	+	..	+	..	+	+	+	+	..	+	..	+	+	+	+	+	+	+	+	+	22
23	Mississippi	+	+	+	+	+	+	+	+	..	+	..	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	23
24	Missouri	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	24
25	Montana	+	+	+	+	+	..	+	+	..	..	..	..	+	+	+	+	..	+	+	..	+	+	+	..	..	+	+	+	..	+	..	+	25
26	Nebraska	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	26
27	Nevada	..	..	+[21]	+	+	..	..	..	..	+	..	+	+	+	+	+	+	+	+	..	+	+	+	..	+	+	..	+	..	..	..	..	27
28	New Hampshire	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	28
29	New Jersey	+	..	..	+	+	..	..	+	..	+	..	+	+	+	+	+	+	+	+	..	+	+	..	..	+	..	+	..	..	..	..	..	29
30	New Mexico	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	30
31	New York	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	31
32	North Carolina	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	32
33	North Dakota	+	..	+	+	+	..	..	..	..	+	..	+	+	+	+	+	+	..	..	+	..	..	+	+	+	+	+	+	+	+	+	33
34	Ohio	+	+	+	+	+	+	+	+	..	+	..	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	34
35	Oklahoma	+	+	+	+	+	+	+	+	..	+	..	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	35
36	Oregon	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	36
37	Pennsylvania	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	37
38	Rhode Island	No reciprocal relations							..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	38
39	South Carolina	+	..	..	..	..	..	..	..	..	+	..	..	..	..	+	+	+	+	+	..	+	..	..	..	..	..	..	..	+	+	..	39
40	South Dakota	+	+	+	+	+	..	..	..	..	+	..	..	+	+	+	+	+	..	..	..	+	+	..	+	+	..	+	+	..	..	..	+	40
41	Tennessee	+	+	+	+	+	+	+	+	..	+	..	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	..	+	+	+	+	41
42	Texas	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	42
43	Utah	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	43
44	Vermont	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	44
45	Virginia	+	..	+	+	..	..	+	+	..	+	..	..	+	+	+	+	+	+	+	..	+	+	+	..	+	+	..	+	+	+	+	45
46	Washington	+	..	..	+	+	..	..	..	..	+	..	..	..	+	..	+	+	..	+	..	+	+	+	+	+	+	..	..	..	..	..	..	46
47	West Virginia	+	..	+	..	..	..	+	+	..	+	..	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	..	+	..	+	..	..	47
48	Wisconsin	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	48
49	Wyoming	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	49
50	Alaska	+	..	+	+	+	+	..	+	..	..	..	..	+	..	+	+	..	..	+	..	+	+	+	..	+	..	+	+	+	..	..	..	50
51	Hawaii	No reciprocal relations							..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	51
52	Puerto Rico	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	52

Some states have additional requirements for graduates of schools outside the United States and Canada.

+, indicates reciprocal or endorsement relationships have been established; .. indicates no reciprocal or endorsement relationships have been established.

1. 1st P, first papers required; ⊕, full citizenship required.
2. In most cases there is a small additional recording or registration fee.
3. If state of original license grants similar privileges.
4. Internship accepted in lieu of one year's practice.
5. Professional practice required.
6. No professional practice required.
7. Just preceding application.
8. No basic science reciprocity—examination must be within the state.
9. Basic science certificate required either by reciprocity or examination in addition to basic science subjects of National Board.
10. Reserve officers not eligible.
11. Applicant's diplomate certificate must be dated not less than one year or more than ten years prior to the filing date in California of an application; applicant must also have been a resident of some state or territory of the United States for a period of at least one year after the date of his diplomate certificate.
12. Oral examination required when original license is ten or more years old.
13. Applicant must have resided in the state used as basis of application for one year after date on said certificate.
14. Oral examination required.
15. Unless in practice in another state for five years.
16. Actual practice for a period of three years immediately preceding date of application.
17. Practical, clinical examination required.
19. Regular and Homeopathic boards.
20. Graduates of foreign medical schools may be accepted if they present also a diploma from an approved medical school in the United States.
21. Regular board.
22. Fee same as applicant's state charges if more than $50.
23. Oral examination required if applicant's state requires it.
24. If an applicant passes the examination in the state from which he transfers after the completion of his internship, no practice is required.

issued. The examining boards use their discretion in determining the acceptability of a candidate. This table has proved to be of material assistance to those contemplating moving their practice. There is also indicated whether diplomates of the National Board of Medical Examiners and retired officers of the government services are eligible for licensure on the basis of lining citizenship requirements. Florida does not have reciprocal or endorsement relations. Idaho, Massachusetts and Rhode Island likewise do not have reciprocal relations but will register diplomates of the National Board of Medical Examiners by endorsement. Additional requisites or exemptions are mentioned in the footnotes.

Endorsement Policies

Marginal Number	Reciprocates with, or Endorses Certificates Granted by: New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	Alaska	Puerto Rico	At the Discretion of the Board	National Board of Medical Examiners	U. S. Government Services	Requirements: Basic Science Certificate	Internship	Professional Practice	Citizenship [1]	Fees, Dollars [2]	Miscellaneous [3]	Marginal Number
1	+	+	+	+	+	+	+	..	+	+	+	+	..	+	+	+	+	+	+	..	..	+[3]	+	+	..	⊕	1[4]	⊕[45]	50	..	1
2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	+[8,6]	⊕[5]	..	3[4,7]	..	100	[43]	2
3	+	+	+	+	+	..	+	..	+	+	+	+	..	+	+	..	+	+	+	+	..	..	+[9]	..	⊕[5]	⊕	1[4]	⊕	50[30]	[42]	3
4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+[12]	+[9,11,12,43]	+[10,14]	..	..	1[13]	..	100	[43]	4
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+[9]	10	⊕	..	1[4]	1st P	50	[42]	5
6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+[14,44]	+[14,36]	..	⊕[15]	..	3[4,16]	1st P	50	..	6
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+[5]	+	⊕	..	2	⊕	100	..	7
8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+[3]	+[36]	+[5]	⊕	⊕	2[7]	..	50	..	8
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9
10	..	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	..	..	..	..	+	..	..	..	0	⊕	50	..	10
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+[14]	..	..	..	..	⊕	50	..	11
12	..	..	+	+	+	+	+	..	..	..	+	+	+	+	+	..	+	+	+	..	..	..	+[17]	+[10,17]	..	⊕	1[4]	1st P	25	[17,42]	12
13	+	+	+	+	+	+	+	..	..	+	+	+	+	+	+	..	+	+	+	..	..	..	+[49]	..	..	..	1[4]	..	50	..	13
14	+	+	+	+	+	..	+	..	..	+	+	..	+	..	+	+	+	+	+	..	..	..	+	..	⊕	⊕	1[4]	⊕[45]	50	..	14
15	..	+	+	+	+	..	+	..	+	+	+	+	+	+	+	..	+	+	+	+	..	..	+	..	..	..	1[4,7]	⊕	50	[42]	15
16	..	..	..	+	+	..	+	..	+	+	+	+	+	+	+	..	+	+	+	..	..	..	+	+	..	..	1[4]	⊕	50	[42]	16
17	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	..	..	..	..	..	..	[33]	1[4]	1st P[40,46]	50	[20]	17
18	..	..	+	+	+	+	+	..	+	..	+	+	+	+	+	..	+	+	+	..	..	..	+[14]	..	..	..	1[4]	1st P[45]	52	..	18
19	..	+	..	+	+	+	+	..	+	..	+	+	..	+	+	..	+	+	..	+	..	+	+	..	..	..	1[4]	1st P	50	[42]	19
20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	..	..	0	1st P	25	..	20
21	..	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	..	..	+[35]	..	⊕[37]	⊕	1[4]	⊕	55	[24]	21
22	..	+	..	..	+	+	+	..	..	+	+	+	+	+	+	+	+	+	+	..	..	..	+	..	⊕	..	0	⊕[45]	75	[17,42]	22
23	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	..	..	..	+	..	..	..	..	⊕[45]	50	[42]	23
24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+[47]	..	..	..	1[4]	⊕[45]	50	..	24
25	..	+	..	+	+	..	+	..	+	..	+	+	..	+	+	..	+	+	+	..	+	..	+[14]	..	..	..	1[4]	⊕	75	..	25
26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+[36]	..	⊕	..	1[4]	⊕	50	..	26
27	+	..	..	+	+	+	+	..	..	+	+	..	+	+	+	..	+	+	+	..	+	..	+	..	..	..	1[4]	⊕	100	[14,42]	27
28	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	+	..	⊕	0	⊕[45]	[20]	[42]	28
29	+	..	+	+	+	..	+	..	..	..	..	+	+	+	+	..	+	+	..	..	..	+	+	..	..	⊕	0	⊕	100	..	29
30	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	+	⊕	..	1[4]	1st P	50	[42]	30
31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	..	..	2	1st P	25	..	31
32	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	+	..	..	0	⊕	50	[42]	32
33	..	+	..	+	+	+	+	..	..	+	..	+	+	+	+	+	+	+	+	+	..	..	+	..	..	⊕	1	⊕[45]	50[22]	[14,42]	33
34	..	+	+	..	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	..	+	+	..	..	..	1[4]	⊕	50	[23]	34
35	..	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	..	..	[50]	+	..	⊕	⊕	1[4]	⊕	100	[42]	35
36	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+[9,36]	..	⊕	⊕	1[4]	..	100	[51]	36
37	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	+	..	..	2[24]	1st P	100	[42]	37
38	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+[14]	..	⊕	⊕	0	1st P	20	..	38
39	..	+	..	+	+	..	+	..	..	..	..	..	..	..	..	..	..	..	+	..	..	..	+	..	..	..	1[4]	⊕	50	[42]	39
40	..	+	+	+	+	+	..	..	+	..	+	+	+	+	+	+	+	+	+	..	..	..	+	+	⊕	⊕	1	1st P	50	[42]	40
41	+	+	..	+	+	..	+	..	+	+	..	+	+	..	+	+	+	+	+	..	..	..	+[30]	+	..	..	0	..	10	[42]	41
42	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	+	..	..	1[25]	⊕	50	[31]	42
43	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	+	..	⊕	[48]	⊕[45]	50	[42]	43
44	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+[38]	..	..	⊕	0	⊕	50	..	44
45	+	+	..	+	+	..	+	..	+	+	+	+	..	+	..	+	+	+	+	..	..	+	+	+	..	..	2[26]	⊕[45]	50	..	45
46	..	..	..	+	+	+	..	..	..	+	+	+	+	+	..	..	..	+	..	+	..	..	+[8]	..	⊕[5]	..	0	1st P	25	[42]	46
47	..	+[27]	+	+	+	..	+	..	+	+	+	+	+	+	+	..	..	+[28]	+	..	..	..	+	..	⊕	⊕	2	⊕	100	[42]	47
48	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+[14]	..	+	⊕	⊕	1[29]	1st P	50[23]	[42]	48
49	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+[14]	+[14]	+	..	⊕	0	⊕	50	..	49
50	..	+	+	+	+	..	..	..	..	..	+	+	+	+	+	+	+	+	..	..	..	..	+	..	..	⊕	0	⊕	100	..	50
51	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+[14]	..	..	⊕	..	⊕	25	[42]	51
52	..	..	..	..	..	..	+	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+[39]	..	⊕	0	⊕	25	..	52

25. Internship accepted if served in this state.
26. Internship accepted—considered equivalent to two years' practice.
27. Five years' practice.
28. Conditionally.
29. A two year internship is accepted.
30. License by National Board certificate at examination fee of $25 unless holding a license from another state.
31. Graduates before 1907 required to take oral examination.
32. Clinical examination required.
33. Reciprocity applicants only.
34. Supplemental examination required in certain cases when accepting the examination of a state with whom reciprocal relations have not been established.
35 May be licensed after a special (written) supplemental examination.
36. Fee for license on basis of National Board certificate $25.
37. For matriculants after Oct. 15, 1937.
38. Fee, $20.
39. While on active duty only.
40. Permanent license withheld until completion of citizenship.
41. Graduates of foreign medical schools effective Sept. 15, 1935. Canadian schools exempted effective Sept. 19, 1939.
42. Graduates of foreign medical schools are not accepted.
43. Graduates of foreign medical schools must have fulfilled all requirements of California prior to admittance to examination for any certificate used as basis of application to California.
44. A New York license not acceptable.
45. Not applicable to citizens of Canada.
46. Canadian citizens are required to file first papers.
47. Fee, $15.
48. Same as required of Utah candidates applying for licensure.
49. Diplomates are accepted on basis of reexamination. The question and answer manuscripts from the National Board are submitted for regrading.
50. Oklahoma will refuse recognition to any state that refuses to reciprocate with Oklahoma.
51. All applicants must be graduates of a medical school approved by the American Medical Association.

their credentials. Specific requirements such as professional practice, basic science certificate, oral examination and internship are recorded, as is also the fee for a license without written examination. For the benefit of noncitizens there is included a column out-

The number of physicians granted licenses in 1941 to practice medicine and surgery without examination on presentation of satisfactory credentials is given in table 16. There were 2,729 so registered who pre-

(CONTINUED ON PAGE 160)

TABLE 14.—*Candidates Licensed by Reciprocity and Endorsement, 1941*

Marginal Number	SCHOOL	1 Alabama	2 Arizona	3 Arkansas	4 California	5 Colorado	6 Connecticut	7 Delaware	8 District of Columbia	9 Florida	10 Georgia	11 Idaho	12 Illinois	13 Indiana	14 Iowa	15 Kansas	16 Kentucky	17 Louisiana	18 Maine	19 Maryland	20 Massachusetts	21 Michigan	22 Minnesota	23 Mississippi	24 Missouri	25 Montana	26 Nebraska	27 Nevada	28 New Hampshire	29 New Jersey	30 New Mexico	31 New York	32 North Carolina	33 North Dakota	34 Ohio	35 Oklahoma	36 Oregon	37 Pennsylvania	38 Rhode Island	39 South Carolina	40 South Dakota	41 Tennessee	42 Texas	43 Utah	44 Vermont	45 Virginia	46 Washington	47 West Virginia	48 Wisconsin	49 Wyoming	50 Alaska, Hawaii and Virgin Islands	Totals	Marginal Number
	ARKANSAS																																																			
1	University of Arkansas School of Medicine	2	1	..	3	..	..	..	..	..	..	..	2	1	1	..	2	2	..	..	..	2	..	..	4	..	..	..	..	..	..	2	..	2	..	1	1	..	..	..	..	..	..	2	3	..	..	..	..	..	2	1	..	34	1
	CALIFORNIA																																																			
2	College of Medical Evangelists	..	1	..	10	3	..	..	1	..	1	..	..	1	..	..	1	..	..	4	1	..	1	..	..	..	..	1	..	..	1	..	1	..	6	1	2	..	..	..	..	..	4	1	..	..	..	3	..	..	..	2	46	2
3	Stanford University School of Medicine	..	2	..	1	..	..	..	..	..	..	..	1	2	..	..	..	..	..	1	..	..	2	..	..	..	..	..	..	..	..	1	..	..	1	..	1	..	..	..	..	..	..	..	1	..	..	1	..	..	..	..	15	3
4	University of California Medical School	..	..	..	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	4
5	University of Southern California School of Medicine	..	..	..	2	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	5
	COLORADO																																																			
6	University of Colorado School of Medicine	..	..	..	3	..	1	..	..	..	..	..	..	1	..	..	..	..	..	..	1	3	..	1	1	1	2	1	..	..	1	..	..	..	1	..	1	2	..	..	..	..	3	..	..	..	1	..	..	1	..	25	6
	CONNECTICUT																																																			
7	Yale University School of Medicine	1	1	1	6	..	13	..	1	..	..	..	2	1	..	1	1	..	1	3	2	2	..	..	1	..	..	..	1	2	..	5	2	..	2	..	1	1	1	..	..	..	..	..	..	2	..	..	..	..	..	..	54	7
	DISTRICT OF COLUMBIA																																																			
8	George Washington University School of Medicine	1	..	..	1	..	..	..	5	..	..	..	..	..	..	..	..	..	1	3	..	1	..	..	..	..	..	..	..	..	1	..	..	2	..	2	..	..	..	..	..	..	..	..	1	..	6	..	..	..	..	..	24	8
9	Georgetown University School of Medicine	..	..	..	..	..	1	..	18	..	..	..	1	..	..	..	..	..	1	..	2	1	..	..	..	..	1	..	..	..	3	..	18	..	..	1	..	..	2	..	..	..	..	1	..	..	4	..	2	..	..	1	57	9
10	Howard University College of Medicine	1	..	..	1	..	..	..	2	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	3	..	1	..	..	..	1	..	2	..	..	..	..	2	..	..	2	..	1	..	..	..	18	10
	GEORGIA																																																			
11	Emory University School of Medicine	2	..	..	4	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	2	..	..	..	1	..	..	1	..	..	..	..	..	..	..	2	..	2	..	..	..	4	..	2	..	..	..	22	11
12	University of Georgia School of Medicine	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	1	..	..	1	..	..	..	1	..	9	12
	ILLINOIS																																																			
13	Loyola University School of Medicine	1	..	..	6	..	..	..	..	..	1	..	3	4	2	..	1	..	..	..	..	2	1	..	..	..	..	..	..	..	1	1	1	..	..	1	..	..	1	..	..	..	..	1	..	..	1	..	1	3	..	..	32	13
14	Northwestern University Medical School	2	1	1	6	..	1	..	..	..	..	..	11	3	4	2	1	..	..	..	2	9	2	1	2	5	1	1	..	1	4	3	..	..	4	2	3	2	..	..	1	..	1	..	..	1	3	1	4	..	2	87	14
15	University of Chicago, Rush Medical College	1	1	..	10	2	..	..	1	..	..	..	9	5	3	2	2	..	..	..	1	6	2	..	4	1	..	1	1	1	1	3	..	2	4	2	1	1	..	..	..	2	..	..	..	1	4	2	4	..	2	82	15
16	University of Chicago, The School of Medicine	..	..	..	2	..	1	..	..	..	..	..	2	3	..	..	..	..	..	..	..	5	1	..	..	1	..	..	..	..	..	2	..	1	4	..	1	..	..	..	..	..	..	2	1	1	..	..	2	1	1	..	29	16
17	University of Illinois College of Medicine	3	1	1	5	..	..	..	..	..	..	..	3	7	..	..	1	..	..	..	..	6	..	1	5	..	..	1	1	..	3	..	2	..	3	..	..	1	..	..	..	2	5	..	..	..	1	1	5	..	..	58	17
	INDIANA																																																			
18	Indiana University School of Medicine	1	..	..	2	..	..	..	1	..	..	..	4	..	..	..	2	..	..	1	1	11	..	1	..	..	..	..	..	..	..	..	1	..	..	3	2	..	2	..	..	..	..	2	..	..	..	..	..	..	1	..	35	18
	IOWA																																																			
19	State University of Iowa College of Medicine	2	..	..	6	1	1	..	..	..	..	..	1	1	2	..	..	..	..	..	..	3	3	..	3	..	1	..	..	1	2	5	1	..	3	..	..	..	..	..	..	1	2	..	..	1	1	..	1	..	..	42	19
	KANSAS																																																			
20	University of Kansas School of Medicine	..	..	..	11	3	..	..	..	..	..	..	2	1	2	..	1	1	..	..	..	4	..	..	9	..	1	1	..	..	..	..	..	..	1	1	1	..	..	..	..	..	3	..	..	..	..	..	3	..	..	45	20
	KENTUCKY																																																			
21	University of Louisville School of Medicine	3	..	..	2	..	..	..	1	..	3	..	1	10	..	2	1	..	..	1	..	3	..	1	4	..	..	..	..	2	..	..	2	..	4	2	1	1	..	1	..	2	4	1	..	4	1	2	2	..	..	61	21
	LOUISIANA																																																			
22	Louisiana State University School of Medicine	5	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	2	..	..	..	..	..	..	..	..	..	2	..	1	..	..	..	..	..	..	3	1	..	..	1	..	..	..	..	18	22
23	Tulane University of Louisiana School of Medicine	4	..	1	4	..	..	..	..	..	2	..	2	..	1	1	..	..	..	..	..	1	..	6	..	1	..	1	..	1	..	1	..	3	1	..	1	3	..	..	..	2	..	1	10	..	..	3	..	..	1	..	3	53	23
	MARYLAND																																																			
24	Johns Hopkins University School of Medicine	4	..	..	5	..	8	..	2	..	1	..	1	1	..	..	1	..	..	2	..	8	..	1	1	..	..	..	..	..	..	..	6	5	..	2	2	1	3	..	..	..	1	..	..	..	2	2	..	..	..	1	60	24
25	University of Maryland School of Medicine and College of Physicians and Surgeons	..	1	..	2	..	1	..	4	..	..	..	..	..	..	..	..	..	..	2	..	..	1	..	..	1	..	..	1	..	..	1	..	..	4	..	..	1	..	..	4	..	1	..	2	1	..	..	2	..	6	..	..	..	35	25
	MASSACHUSETTS																																																			
26	Boston University School of Medicine	..	..	1	..	..	3	..	..	..	..	..	1	..	..	..	..	..	2	..	13	..	..	..	..	..	..	..	..	2	1	..	7	..	..	2	..	..	..	2	..	..	..	..	..	1	1	1	..	1	..	..	38	26
27	Harvard Medical School	1	..	..	7	..	6	..	2	..	1	..	2	..	..	1	1	..	5	..	22	5	4	..	..	..	1	..	4	1	..	15	..	1	5	..	..	1	7	..	..	1	2	2	1	1	2	1	1	..	1	104	27
28	Tufts College Medical School	..	..	1	..	..	7	..	2	..	..	..	..	..	..	2	2	..	4	..	28	2	..	1	1	1	..	..	3	2	..	3	1	..	1	1	..	3	2	..	..	..	..	..	1	1	..	1	..	..	..	70	28
	MICHIGAN																																																			
29	University of Michigan Medical School	2	..	..	3	1	3	..	..	..	..	..	4	3	1	1	..	..	1	..	..	1	..	..	2	..	..	..	..	1	..	2	1	1	4	..	1	5	..	..	..	1	2	..	..	1	2	..	1	..	..	44	29
30	Wayne University College of Medicine	..	..	..	2	..	..	..	1	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..	2	..	..	..	..	1	..	1	1	..	1	1	..	..	..	..	..	..	1	2	..	..	..	..	1	1	..	..	17	30
	MINNESOTA																																																			
31	University of Minnesota Medical School	1	1	1	14	1	..	..	..	..	1	..	1	2	2	..	..	..	..	..	1	8	2	..	..	4	1	..	1	..	..	3	..	1	1	1	1	..	..	..	3	..	1	..	..	..	2	1	5	..	1	61	31
	MISSOURI																																																			
32	St. Louis University School of Medicine	..	..	..	8	..	2	..	..	..	..	..	11	3	2	2	..	..	..	..	..	2	..	..	2	1	..	..	..	2	..	3	..	..	7	2	2	1	..	..	..	..	1	..	..	..	3	..	..	..	..	54	32
33	Washington University School of Medicine	1	..	..	7	3	1	..	..	..	..	..	10	..	2	4	..	..	..	..	..	2	..	..	1	..	1	..	..	..	..	1	1	..	2	2	1	..	..	..	..	..	2	2	2	..	..	2	..	2	..	1	50	33

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(CONTINUED FROM PAGE 157)

sented licenses from other states, the District of Columbia, Canada and foreign countries, the certificate of the National Board of Medical Examiners, one of the government services or other credentials.

The greatest number of licenses by this method were issued in New York, where 287 were registered. Seven other states endorsed more than 100 such candidates: California 229, Michigan 188, Ohio 116, Texas 112, Illinois and New Jersey 107 and Massachusetts 100. The largest group representing the same type of credentials were the 714 diplomates of the National Board of Medical Examiners. Two hundred and fourteen were registered on the basis of such credentials in New York and 100 in Massachusetts.

More than 100 physicians holding licenses from Illinois, Missouri, New York, Ohio, Pennsylvania and Tennessee respectively were licensed in other states.

One license was granted in New York by endorsement of a license issued in Germany. Two were registered in this state without examination on the basis of a diploma from a European medical school. Eight presented licenses issued in Canada as follows: 1 each in New York and Wyoming and 2 in Oregon presented a license issued by the dominion of Canada, while a physician was certified in Kentucky on a Newfoundland provincial license, another in Tennessee who presented a New Brunswick credential, and in New York 2 were registered on provincial licenses, namely Ontario and Quebec. California accepted for registration without examination a physician holding a Hawaiian license. Three were admitted to private practice in the Virgin Islands.

Twelve retired officers of one of the government services secured licenses without written examination in six states: 6 in California, 2 in Texas, and 1 each in Kentucky, New Hampshire, North Carolina and Virginia.

Not included in the table are 9 osteopaths licensed by the board of examiners in five states, namely 2 each in the District of Columbia and Oregon and 1 in Virginia granted the right to practice osteopathy and surgery; 3 in Indiana privileged to practice osteopathy, surgery and obstetrics, and 1 in Texas granted unlimited practice.

Diplomates of the National Board of Medical Examiners were licensed in thirty-nine states and Hawaii.

Thirty-nine licentiates of New York secured licenses to continue their practice in New Jersey. Arizona, Connecticut, Delaware, Florida, Idaho, Massachusetts, Mississippi, Montana, Nevada, New Hampshire, North Dakota, Rhode Island, South Dakota, Utah, Vermont, Washington and Wyoming had less than 10 of their licentiates endorsed to other states. None were licensed on the basis of a New Mexico license.

A total of 2,729 physicians secured licenses on endorsement of credentials in 1941. The physicians so licensed and, in addition, 9 osteopaths registered by medical examining boards, are recorded by school of graduation and state or territory where licensed in table 14. Sixty-seven medical schools were represented, as well as seven in Canada, nineteen faculties of medicine and two licensing corporations of other countries, two unapproved medical schools and 33 medical schools now extinct and several osteopathic schools. One hundred and four graduates of Harvard Medical School were registered in twenty-eight states and one of the territories; Northwestern University Medical School had 87 graduates licensed by this method in thirty-one states and the territories. In fact, more than 50 graduates of each of eighteen schools were so recognized for registration. Those holding credentials on the basis of study abroad (52) but registered on the basis of a state license issued in the United States were registered in seventeen states and the District of Columbia. Fifty-three from schools in the United States no longer in existence migrated to twenty states and the District of Columbia, and 18 from unapproved and osteopathic schools were granted licensure privileges in six states and the District of Columbia.

Of the 2,738 candidates licensed by reciprocity and endorsement, 2,559 were graduates of approved medical schools in the United States, 56 of seven schools so approved in Canada, 52 graduates of foreign faculties of medicine, 53 of institutions now extinct and 9 each from unapproved and osteopathic schools.

TABLE 15.—*Licentiates Representing Additions to the Medical Profession, 1941*

	Examination	Reciprocity and Endorsement	Total
Alabama	22	2	24
Arizona	11	..	11
Arkansas	60	2	62
California	347	6	353
Colorado	52	1	53
Connecticut	42	25	67
Delaware	10	..	10
District of Columbia	17	18	35
Florida	58	..	58
Georgia	74	1	75
Idaho	3	..	3
Illinois	438	11	449
Indiana	115	..	115
Iowa	63	1	64
Kansas	89	..	89
Kentucky	79	5	84
Louisiana	127	..	127
Maine	28	3	31
Maryland	163	5	168
Massachusetts	183	75	258
Michigan	214	5	219
Minnesota	157	4	161
Mississippi	35	..	35
Missouri	188	7	195
Montana	1	1	2
Nebraska	91	2	93
Nevada	2	..	2
New Hampshire	9	4	13
New Jersey	149	13	162
New Mexico	2	1	3
New York	804	189	993
North Carolina	53	11	64
North Dakota	3	1	4
Ohio	278	12	290
Oklahoma	50	..	50
Oregon	18	..	18
Pennsylvania	385	14	399
Rhode Island	16	9	25
South Carolina	43	..	43
South Dakota	2	..	2
Tennessee	171	2	173
Texas	176	..	176
Utah	15	1	16
Vermont	15	9	24
Virginia	139	4	143
Washington	63	6	69
West Virginia	20	6	26
Wisconsin	110	..	110
Wyoming	1	..	1
Virgin Islands	22	12	34
Totals	5,213	468	5,681

LICENTIATES REPRESENTING ADDITIONS TO THE MEDICAL PROFESSION

Licentiates of 1941 representing additions to the physician population of the United States and its territories and possessions are recorded in table 15. The figures represent candidates examined in 1941 and licensed; also those examined in previous years whose licenses were withheld for lack of internship, citizenship and other technicalities and issued last year, and those without a state license who were during the year certified on the basis of the certificate of the National Board of Medical Examiners, the government services, Canadian and foreign credentials. In the main they represent recent graduates.

TABLE 16.—*Credentials Presented by Physicians for Licensure by Reciprocity and Endorsement, 1941*

Marginal Number..	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55
	Total Licensed	Alabama	Arizona	Arkansas	California	Colorado	Connecticut	Delaware	District of Columbia	Florida	Georgia	Idaho	Illinois	Indiana	Iowa	Kansas	Kentucky	Louisiana	Maine	Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	U. S. Govt. Services	National Board of Medical Examiners	Hawaii	Canadian & Foreign	Miscellaneous
Alabama	63	..	..	2	1	..	..	..	1	..	5	..	2	1	2	..	3	9	..	4	..	2	..	3	1	..	..	..	..	1	..	6	1	..	1	..	..	2	..	1	..	5	3	..	..	1	..	..	..	..	..	6	..	..	..
Arizona	19	..	..	1	3	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	.	1	..	1	..	..	..	..	1	..	..	2	..	..	2	..	..	..	..	1	..	..	..	..	..	..	..	..	5	..	..	..
Arkansas	23	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	1	..	1	..	..	..	..	2	1	..	..	4	..	1	..	1	..	5	1	..	..	..	..	..	..	..	..	3	..	..	..
California	229	..	1	3	..	3	1	..	..	..	3	1	14	1	8	14	1	5	..	6	1	11	18	..	12	1	11	..	..	2	..	23	1	3	15	2	6	9	2	1	1	3	1	3	..	1	1	1	8	1	6	23	1	..	..
Colorado	34	..	..	..	1	..	..	..	..	1	..	..	1	..	1	3	..	..	..	..	..	1	3	..	3	..	9	..	..	..	..	1	..	..	..	2	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	6	..	..	..
Connecticut	74	1	..	..	..	1	..	..	..	..	..	..	1	..	1	..	..	..	2	5	2	2	..	..	..	..	..	..	..	3	..	3	1	..	4	..	..	1	..	..	..	1	1	..	1	..	..	..	..	..	44	..	..	..
Delaware	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Dist. Columbia	65	..	..	1	3	..	..	..	..	..	..	..	..	1	..	..	..	..	1	6	..	1	..	1	..	..	..	..	..	2	..	5	..	..	2	..	..	8	..	2	..	2	1	..	..	2	..	..	..	..	..	27	..	..	..
Florida	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Georgia	36	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	2	..	2	..	..	1	1	1	..	..	..	..	..	..	..	..	..	..	..	..	2	..	5	..	9	1	..	..	5	..	1	1	..	..	2	..	..	..
Idaho	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Illinois	107	1	..	2	2	..	..	..	..	..	1	..	..	4	1	3	1	3	..	2	..	8	6	..	21	..	6	..	..	1	..	..	..	..	6	..	..	8	..	..	..	4	1	..	..	..	..	..	..	..	..	..	..	..	..
Indiana	94	..	..	..	3	1	..	..	..	..	..	..	20	..	3	3	12	1	..	2	..	7	..	..	5	..	3	..	..	1	..	..	3	1	..	12	1	..	4	..	..	1	5	2	..	..	1	..	1	1	..	..	21	..	..	..
Iowa	47	..	..	1	1	..	..	..	..	..	..	..	6	..	..	2	..	1	..	..	..	1	4	..	4	1	10	..	..	1	..	2	..	..	2	..	..	4	..	..	1	5	2	..	..	1	..	1	1	..	..	1	..	..	..
Kansas	22	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	2	..	..	2	..	..	..	..	..	..	..	..	..	..	1	6	..	..	2	..	..	..
Kentucky	47	1	..	2	1	..	1	..	..	2	1	..	2	1	..	..	2	1	..	..	..	1	..	..	7	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	2	..	..	..
Louisiana	12	..	..	2	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	4	..	..	8	..	..	3	..	..	..	6	..	..	..	1	..	2	..	..	1	7	..	1	..
Maine	29	..	..	..	1	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	3	3	..	..	..	..	..	..	..	..	..	..	..	..
Maryland	27	..	..	..	4	1	..	..	1	..	1	..	1	1	..	..	1	..	..	6	..	2	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1	..	..	..	..	..	15	..	..	..
Massachusetts	100	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	2	..	..	..	2	..	..	..	2	..	..	..	..	..	10	..	..	..
Michigan	188	1	..	2	5	5	..	..	..	..	1	..	21	12	2	3	3	2	2	8	2	..	9	..	4	..	6	..	1	1	..	19	1	1	26	1	..	8	1	..	..	11	10	..	..	1	1	..	9	..	..	9	..	..	..
Minnesota	29	..	..	..	1	..	..	..	..	..	..	..	2	..	3	..	..	1	..	..	..	2	..	..	..	..	3	..	..	..	..	..	..	..	..	1	..	1	..	..	..	6	1	..	..	1	1	..	9	..	..	13	..	..	..
Mississippi	37	1	..	..	..	1	..	..	..	..	..	..	3	1	..	..	1	8	..	1	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Missouri	83	..	..	4	1	..	..	..	..	..	1	..	7	1	3	13	1	2	1	2	..	5	2	..	..	..	2	..	..	..	..	5	..	..	..	1	..	..	2	..	9	3	..	1	1	..	2	..	..	..	..	..	..	..
Montana	20	..	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	1	..	16	2	..	..	2	..	..	1	1	..	8	..	..	..
Nebraska	13	..	..	..	..	2	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	6	..	1	..	1	..	..	..	..	..	..	2	1	..	..	..	..	..	..	..	1	..	..	..	1	..	1	1	..	3	..	..	..
Nevada	12	..	..	..	2	1	..	..	..	..	..	..	3	..	..	1	..	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	..	..	..
New Hampshire	34	1	..	..	..	..	1	..	..	..	..	..	1	..	..	..	1	8	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	3	..	..	..
New Jersey	107	..	..	..	..	..	1	1	..	..	..	..	1	..	1	..	2	..	3	1	2	1	..	..	..	..	..	..	..	1	..	4	..	..	..	..	..	3	..	..	..	..	..	..	2	..	..	1	..	..	1	12	..	..	..
New Mexico	29	..	..	2	1	2	..	..	..	..	..	..	5	..	3	..	..	..	..	2	..	2	..	..	1	..	..	..	..	..	..	39	..	..	9	1	..	14	..	..	..	4	..	..	..	6	..	..	..	..	..	23	..	..	..
New York	287	2	..	..	4	..	..	..	..	..	1	..	..	1	6	..	..	2	..	12	..	3	4	..	1	..	6	..	..	..	..	1	..	1	..	..	1	12	..	..	..	..	3	..	..	..	1	2	..	..	1	..	..	..
North Carolina	65	..	..	2	..	..	..	..	2	..	..	..	1	..	1	..	2	1	1	2	..	3	1	..	2	..	..	..	..	..	..	3	..	..	..	..	..	..	..	..	..	3	..	..	5	2	1	..	..	..	214	..	4	2
North Dakota	10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	5	..	2	..	6	1	..	..	12	..	..	..	1	16	..	..	..
Ohio	116	..	..	1	2	..	..	..	2	..	1	..	11	4	4	1	4	3	..	3	1	8	2	..	9	..	9	..	..	..	..	..	..	..	1	..	..	1	..	..	1	..	..	..	..	..	2	1	..	2	..	..	..
Oklahoma	39	..	..	1	..	..	..	..	1	..	..	..	3	2	..	..	2	1	..	2	1	1	..	1	5	..	..	..	..	1	..	..	..	..	..	..	..	14	..	..	1	3	1	..	1	1	..	1	7	..	..	22	..	..	..
Oregon	30	..	..	..	4	1	..	..	..	..	..	..	1	..	..	2	1	..	..	..	..	2	2	..	2	..	2	1	..	..	..	1	..	..	..	3	..	..	..	..	..	6	3	..	..	2	..	1	..	1	..	2	..	..	..
Pennsylvania	93	..	..	..	..	..	..	2	..	..	..	..	4	3	1	..	..	..	2	8	..	5	1	..	2	..	1	..	..	13	..	13	..	..	3	..	..	..	..	..	..	..	..	1	..	..	2	..	1	..	4	..	2	..
Rhode Island	13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	2	..	2	..	..	..	..	..	..	..	..	..	..	..	3	..	..	..	..	..	2	1	..	..	3	..	2	1	..	..	26	..	..	..
South Carolina	17	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	1	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	2	..	1	..	..	1	..	..	6	..	..	..	2	..	..	..	..	..	13	..	..	..
South Dakota	7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Tennessee	58	..	..	3	1	..	..	..	..	2	..	2	1	1	..	3	1	..	2	..	2	..	3	4	..	4	..	3	..	1	..	10	..	2	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Texas	112	..	..	3	1	2	1	..	..	1	1	..	6	4	2	3	3	15	1	2	..	3	4	..	4	..	3	..	..	1	..	8	12	..	4	1	..	2	..	2	..	..	..	..	..	9	..	1	..	..	..	10	..	1	..
Utah	10	..	1	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..	10	..	..	..	..	4	..	1	3	..	2	..	..	..	..	..	..	..
Vermont	14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	1	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..
Virginia	70	1	..	..	..	..	..	..	4	..	5	..	1	..	1	..	3	4	1	5	..	1	..	2	1	..	2	..	1	..	3	4	..	3	1	..	6	..	2	..	5	..	..	..	..	..	..	..	..	..	9	..	..	..
Washington	60	..	..	..	7	2	..	..	..	..	..	..	..	..	1	..	1	1	..	2	..	3	2	..	6	2	5	..	..	..	..	..	..	..	..	2	5	2	..	..	..	1	..	1	1	..	..	..	1	1	..	1	11	..	..	..
West Virginia	59	..	..	..	..	1	..	1	..	..	2	..	2	..	..	..	1	..	..	6	..	4	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	4	..	..	12	..	..	..
Wisconsin	52	..	1	2	2	..	..	..	..	..	..	..	14	1	1	4	3	2	1	..	..	3	6	..	2	..	2	..	..	..	..	..	..	..	6	1	..	7	..	..	..	3	..	..	..	14	..	..	1	..	..	8	..	..	..
Wyoming	12	..	..	1	..	1	1	..	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	..	1	1	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..
Alaska, Hawaii, Virgin Islands	21	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..
Totals	2,729	10	3	35	56	26	7	4	13	4	28	1	141	40	48	55	54	67	18	93	9	87	78	9	105	4	92	1	2	29	0	162	19	9	122	36	13	130	4	19	4	131	43	5	7	76	9	18	56	6	12	714	1	9	5
Marginal Number..	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55

There were 5,681 additions to the medical profession in 1941. The number removed by death annually approximates 3,700. It would appear that the physician population in 1941 was increased therefore by about 1,900. While it cannot be said that all those licensed are in practice, it may be assumed that the great majority are. The greatest number in any one state were added in New York, 993, and 449 in Illinois. More than 300 received their first license in California and Pennsylvania. The states of Indiana, Louisiana, Maryland, Minnesota, Missouri, New Jersey, Tennessee, Texas, Virginia and Wisconsin increased their population of physicians by between 100 and 201. Thirty-one states, the District of Columbia, Alaska, Hawaii, Puerto Rico and the Virgin Islands added fewer than 100.

Of the licentiates constituting additions to the medical profession last year, 5,213 secured their license after examination and 468 by endorsement of credentials.

Figures for six previous years and 1941 are shown in table 17 for comparison. In 1935 there were 5,099 by examination and 411 by endorsement of credentials, a total of 5,510 additions. In 1936 there were 667 more added than in the previous year, in 1937 247 more than in 1936 and 914 more than in 1935. Since 1937 there has been a reduction in the number of those representing additions to the profession. In 1941 there were 743 fewer than in 1937, when the greatest number were licensed.

TABLE 17.—*Licentiates Representing Additions to the Medical Profession, 1935-1941*

Year	Examination	Reciprocity and Endorsement	Total
1935	5,099	411	5,510
1936	5,548	629	6,177
1937	5,812	612	6,424
1938	5,739	501	6,240
1939	5,584	460	6,044
1940	5,432	455	5,887
1941	5,213	468	5,681
Totals	38,447	3,536	41,983

In seven years altogether 41,983 received original licenses, 38,447 after written examination and 3,536 by endorsement of credentials. In the same period 63,495 licenses were issued, 43,895 by examination and 19,600 by endorsement of credentials. Of these 21,512 were previously licensed.

Increases in the physician population arranged in nine geographic divisions are shown in table 18. The greatest number, 1,554, were added in the Middle Atlantic states. The East North Central group added 1,183, the South Atlantic 622, the West North Central 608, the Pacific group 440, the New England states 418, the West South Central group 415 and the Mountain states 91. Nineteen were added in Hawaii, 11 in Puerto Rico and 2 each in Alaska and the Virgin Islands.

In table 19 data pertaining to those securing their first medical licenses are arranged by school of graduation. The largest number from any one school was 152 graduates of the University of Illinois College of Medicine. Northwestern University Medical School had 135 of its graduates registered in 1941. Fourteen other schools contributed 100 or more. Of the United States schools, Albany Medical College and the Woman's Medical College of Pennsylvania had the fewest, 19, while only 1 represented University of Montreal Faculty of Medicine. McGill University Faculty of Medicine added 44 of its graduates to the medical profession in the United States.

From the United States schools there were added to the profession by examination 4,290 graduates and 448 by reciprocity or endorsement, a total of 4,738; from the Canadian schools 90, by examination 85 and without 5. There were 626 graduates of foreign faculties of medicine, 226 from unapproved schools and from a school now extinct.

TABLE 18.—*Licentiates Representing Additions to the Medical Profession Grouped in Geographic Divisions, 1941*

	Examination	Reciprocity and Endorsement	Total
New England			
Maine	28	3	31
New Hampshire	9	4	13
Vermont	15	9	24
Massachusetts	183	75	258
Rhode Island	16	9	25
Connecticut	42	25	67
	293	125	418
Middle Atlantic			
New York	804	189	993
New Jersey	149	13	162
Pennsylvania	385	14	399
	1,338	216	1,554
East North Central			
Ohio	278	12	290
Indiana	115	..	115
Illinois	438	11	449
Michigan	214	5	219
Wisconsin	110	..	110
	1,155	28	1,183
West North Central			
Minnesota	157	4	161
Iowa	63	1	64
Missouri	188	7	195
North Dakota	3	1	4
South Dakota	2	..	2
Nebraska	91	2	93
Kansas	89	..	89
	593	15	608
South Atlantic			
Delaware	10	..	10
Maryland	163	5	168
District of Columbia	17	18	35
Virginia	139	4	143
West Virginia	20	6	26
North Carolina	53	11	64
South Carolina	43	..	43
Georgia	74	1	75
Florida	58	..	58
	577	45	622
East South Central			
Kentucky	79	5	84
Tennessee	171	2	173
Alabama	22	2	24
Mississippi	35	..	35
	307	9	316
West South Central			
Arkansas	60	2	62
Louisiana	127	..	127
Oklahoma	50	..	50
Texas	176	..	176
	413	2	415
Mountain			
Montana	1	1	2
Idaho	3	..	3
Wyoming	1	..	1
Colorado	52	1	53
New Mexico	2	1	3
Arizona	11	..	11
Utah	15	1	16
Nevada	2	..	2
	87	4	91
Pacific			
Washington	63	6	69
Oregon	18	..	18
California	347	6	353
	428	12	440
Territories and Possessions			
Alaska	1	1	2
Hawaii	10	9	19
Puerto Rico	11	..	11
Virgin Islands	..	2	2
	22	12	34
Totals	5,213	468	5,681

Altogether there were 5,213 graduates of all schools added to the medical profession in 1941 by examination for licensure and 468 by reciprocity and endorsement, a total of 5,681. The number of living physicians in the United States in 1941 was approximately 180,871.

STATE REQUIREMENTS OF PRELIMINARY EDUCATION

The minimum requirement for admission to approved medical schools since 1918 has been two years of collegiate training, and since 1938 three years has been recommended. With but four exceptions, namely California, Connecticut, Massachusetts and Nebraska, the state licensing boards also specify two years or more of college as a preliminary requirement. Although their statutes do not conform with the two year requirement the states just named, with the exception of Massachusetts, do not license other than graduates of approved schools, whose graduates since 1918 have had two years or more of college work preliminary to beginning the study of medicine. This information is given in table 20. Alaska, Hawaii and Puerto Rico likewise require two years of preliminary training.

REQUIRED HOSPITAL INTERNSHIPS

In tables 21 and 22 are listed the medical schools and licensing boards now requiring internships for the M.D. degree and licensure respectively.

The medical licensing boards of twenty states, the District of Columbia, Alaska, Hawaii and Puerto Rico require that all applicants for licensure serve a hospital internship. The Louisiana board in February 1942 rescinded its rule regarding a year's rotating internship in an approved hospital as a requisite for obtaining a certificate to practice medicine. The present war emergency together with the accelerated curriculum by undergraduate medical schools and the inability to keep an intelligent check on the various hospitals was the reason for dropping the requirement.

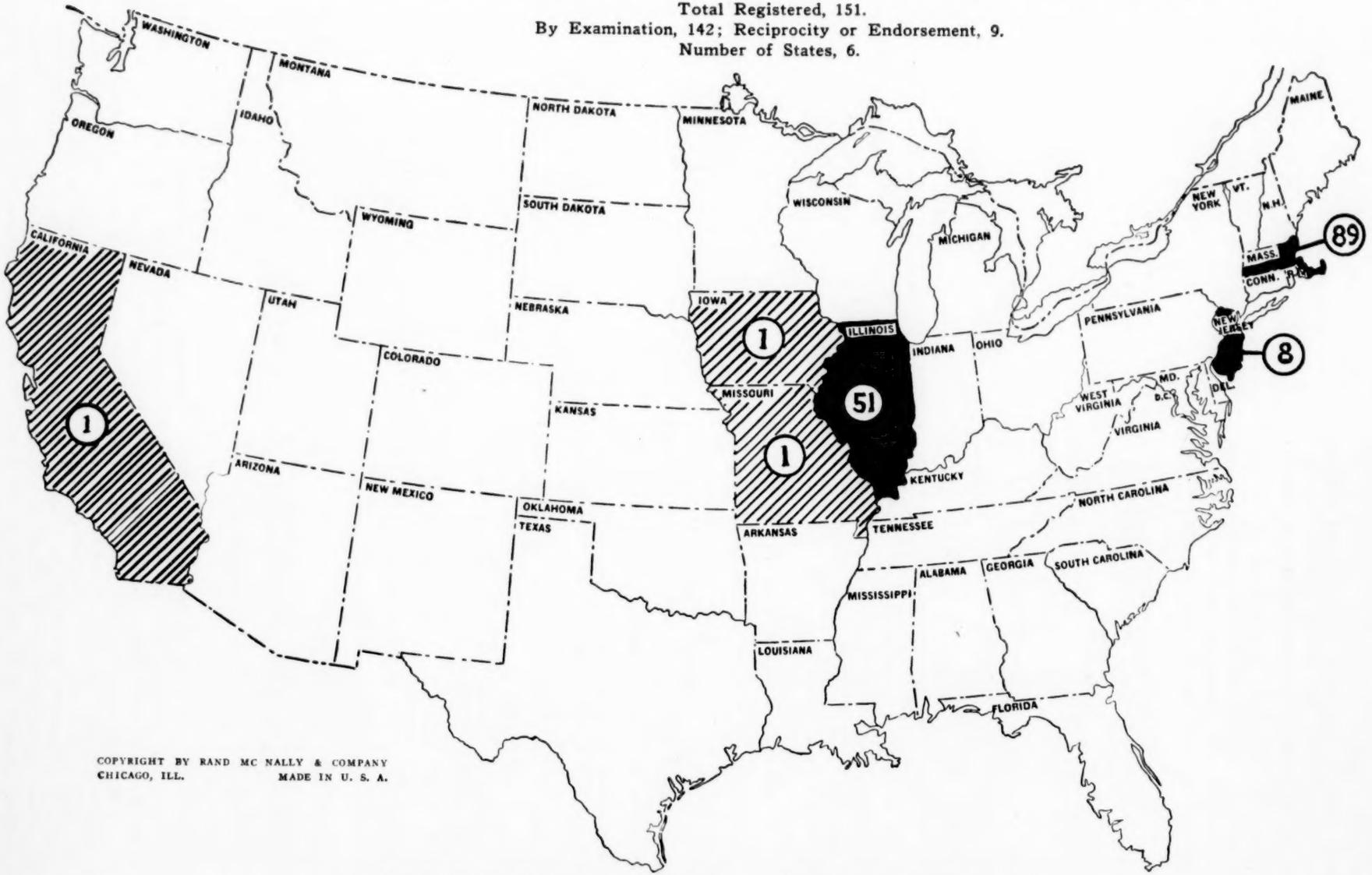
Ten medical schools in the United States and three in Canada require completion of an internship before

TABLE 19.—*Licentiates Representing Additions to the Medical Profession Classified by Schools, 1941*

School	Examination	Reciprocity and Endorsement	Totals
ARKANSAS			
University of Arkansas School of Medicine	62	..	62
CALIFORNIA			
College of Medical Evangelists	81	7	88
Stanford University School of Medicine	53	..	53
University of California Medical School	51	..	51
University of Southern California School of Medicine	48	1	49
COLORADO			
University of Colorado School of Medicine	40	1	41
CONNECTICUT			
Yale University School of Medicine	15	26	41
DISTRICT OF COLUMBIA			
George Washington University School of Medicine	37	4	41
Georgetown University School of Medicine	57	32	89
Howard University College of Medicine	27	..	27
GEORGIA			
Emory University School of Medicine	51	1	52
University of Georgia School of Medicine	37	..	37
ILLINOIS			
Loyola University School of Medicine	110	2	112
Northwestern University Medical School	124	11	135
University of Chicago, Rush Medical College	105	5	110
University of Chicago, The School of Medicine	31	3	34
University of Illinois College of Medicine	150	2	152
INDIANA			
Indiana University School of Medicine	101	..	101
IOWA			
State University of Iowa College of Medicine	63	1	64
KANSAS			
University of Kansas School of Medicine	80	..	80
KENTUCKY			
University of Louisville School of Medicine	85	..	85
LOUISIANA			
Louisiana State University School of Medicine	61	..	61
Tulane University of Louisiana School of Medicine	104	1	105
MARYLAND			
Johns Hopkins University School of Medicine	59	7	66
University of Maryland School of Medicine and College of Physicians and Surgeons	77	2	79
MASSACHUSETTS			
Boston University School of Medicine	6	26	32
Harvard Medical School	60	51	111
Tufts College Medical School	19	40	59
MICHIGAN			
University of Michigan Medical School	100	1	101
Wayne University College of Medicine	58	..	58
MINNESOTA			
University of Minnesota Medical School	126	1	127
MISSOURI			
St. Louis University School of Medicine	96	6	102
Washington University School of Medicine	101	2	103
NEBRASKA			
Creighton University School of Medicine	51	4	55
University of Nebraska College of Medicine	75	4	79
NEW YORK			
Albany Medical College	1	18	19
Columbia University College of Phys. and Surgs.	86	11	97
NEW YORY—Continued			
Cornell University Medical College	53	14	67
Long Island College of Medicine	57	12	69
New York Medical College, Flower and Fifth Avenue Hospitals	11	38	49
New York University College of Medicine	98	15	113
Syracuse University College of Medicine	30	1	31
University of Buffalo School of Medicine	16	22	38
University of Rochester Sch. of Medicine and Dentistry	33	3	36
NORTH CAROLINA			
Duke University School of Medicine	9	33	42
OHIO			
Ohio State University College of Medicine	68	..	68
University of Cincinnati College of Medicine	72	2	74
Western Reserve University School of Medicine	60	..	60
OKLAHOMA			
University of Oklahoma School of Medicine	59	..	59
OREGON			
University of Oregon Medical School	42	1	43
PENNSYLVANIA			
Hahnemann Medical Coll. and Hosp. of Philadelphia	121	..	121
Jefferson Medical College of Philadelphia	125	3	128
Temple University School of Medicine	102	4	106
University of Pennsylvania School of Medicine	137	4	141
University of Pittsburgh School of Medicine	45	1	46
Woman's Medical College of Pennsylvania	13	6	19
SOUTH CAROLINA			
Medical College of the State of South Carolina	48	..	48
TENNESSEE			
Meharry Medical College	49	1	50
University of Tennessee College of Medicine	86	..	86
Vanderbilt University School of Medicine	58	1	59
TEXAS			
Baylor University College of Medicine	65	..	65
University of Texas Medical Branch	88	..	88
VERMONT			
University of Vermont College of Medicine	12	11	23
VIRGINIA			
Medical College of Virginia	78	2	80
University of Virginia Department of Medicine	53	..	53
WISCONSIN			
Marquette University School of Medicine	65	4	69
University of Wisconsin Medical School	49	..	49
CANADA			
Dalhousie University Faculty of Medicine	9	..	9
Laval University Faculty of Medicine	4	..	4
McGill University Faculty of Medicine	39	5	44
Queen's University Faculty of Medicine	2	..	2
University of Alberta Faculty of Medicine	1	..	1
University of Manitoba Faculty of Medicine	3	..	3
University of Montreal Faculty of Medicine	1	..	1
University of Toronto Faculty of Medicine	20	..	20
University of Western Ontario Medical School	6	..	6
Foreign Medical Faculties	612	14	626
Extinct Medical Schools	1	..	1
Unapproved Schools	225	1	226
Totals	5,213	468	5,681

CHART 1.—STATES REGISTERING GRADUATES OF UNAPPROVED MEDICAL SCHOOLS, 1941

Total Registered, 151.
By Examination, 142; Reciprocity or Endorsement, 9.
Number of States, 6.



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The states in black registered more than 5 such candidates, those shaded 5 or less.

awarding the M.D. degree. Several medical schools will accept research or other clinical work in lieu of hospital service. One school recently awarded the M.D. degree to 2 of its seniors, in 1 case before completion of, and in another without, an internship, since these 2 men are members of the military hospital unit of the school. At the University of Illinois College of Medicine the internship requirement was waived in 1941 because of the national emergency. The University of California Medical School has discontinued the requirement of an internship for the seniors of 1941-1942 and, since the school is planning to accelerate the curriculum, it will no longer be a requirement for the M.D. degree.

TABLE 20.—*Requirements of Preliminary Training by Medical Licensing Boards*

Two Years or More of College		
Alabama	Louisiana	Oklahoma
Alaska	Maine	Oregon
Arizona	Maryland	Pennsylvania
Arkansas	Michigan	Puerto Rico
Colorado	Minnesota	Rhode Island
Delaware	Mississippi	South Carolina
District of Columbia	Missouri	South Dakota
Florida	Montana	Tennessee
Georgia	Nevada	Texas
Hawaii	New Hampshire	Utah
Idaho	New Jersey	Vermont
Illinois	New Mexico	Virginia
Indiana	New York	Washington
Iowa	North Carolina	West Virginia
Kansas	North Dakota	Wisconsin
Kentucky	Ohio	Wyoming
One Year of College		
California		Connecticut
High School Graduation or Its Equivalent		
Massachusetts		Nebraska

The University of Minnesota Medical School in 1915 was the first school to adopt the internship as a basis for the M.D. degree, and the first state exacting this requirement was Pennsylvania in 1914. Several states, in addition, require graduates of medical faculties abroad and reciprocity or endorsement applicants to have completed an internship. These states and schools are recorded in tabulations presented in this group under their respective headings. Since 1936 seven schools have dropped the internship requirement, i. e. Rush Medical College and the University of Chicago School of Medicine in 1936, Louisiana State University School of Medicine in 1940, the University of Cincinnati School of Medicine, the University of Illinois College of Medicine and McGill University Faculty of Medicine in 1941 and the University of California Medical School in 1942. The M.D. degree is conferred by Duke University School of Medicine after completion of the senior year, but all graduates are required to spend two years in a hospital or laboratory work after graduation. In 1941 this school agreed to accept one year of military service in lieu of the second year of internship. There have been no recent additions to either table 21 or 22 by institution of the requirement by a medical school or licensing board.

TABLE 21.—*Internship Required by Medical Schools*

College of Medical Evangelists
University of Southern California School of Medicine
Stanford University School of Medicine
Loyola University School of Medicine
Northwestern University Medical School
Wayne University College of Medicine
University of Minnesota Medical School
Duke University School of Medicine
University of Cincinnati College of Medicine
Marquette University School of Medicine
University of Manitoba Faculty of Medicine
Dalhousie University Faculty of Medicine
University of Montreal Faculty of Medicine

CANDIDATES EXAMINED

The number of candidates examined in the United States, its territories and possessions in the five year period 1937-1941 are given in table 23. For each year there is recorded the number who passed and failed licensing examinations. Totals for the five year period and the percentage of candidates who failed are also given.

During this period 37,985 were tested, of whom 32,006 were successful and 5,979, 15.7 per cent, failed. Of these, 3,414 were examined in New York and passed, 2,517 in Illinois, 2,513 in Pennsylvania and 1,930 in California. More than 1,000 were successful also in Massachusetts, Michigan, Minnesota, New Jersey and Ohio. Nine states examined and passed between 500 and 1,000 applicants for licensure, thirty states and the District of Columbia registered fewer than 500 and in ten of these less than 100. The smallest number, 8, passed examinations in New Mexico.

The percentage of failures in all states and the territories and possessions has increased from 10.0 in 1937 to 20.6 in 1940. The number failing in 1941 was 19.7 per cent.

TABLE 22.—*Internship Required by Medical Licensing Boards of All Candidates* *

Alabama	New Hampshire	Utah
Alaska	New Jersey	Vermont
Delaware	North Dakota	Washington
District of Columbia	Oklahoma	West Virginia
Hawaii	Oregon	Wisconsin
Idaho	Pennsylvania	Wyoming
Illinois	Puerto Rico	
Iowa	Rhode Island	
Michigan	South Dakota	

* In addition some states require the internship of graduates of medical faculties abroad and reciprocity or endorsement applicants. See tables 13 and 29.

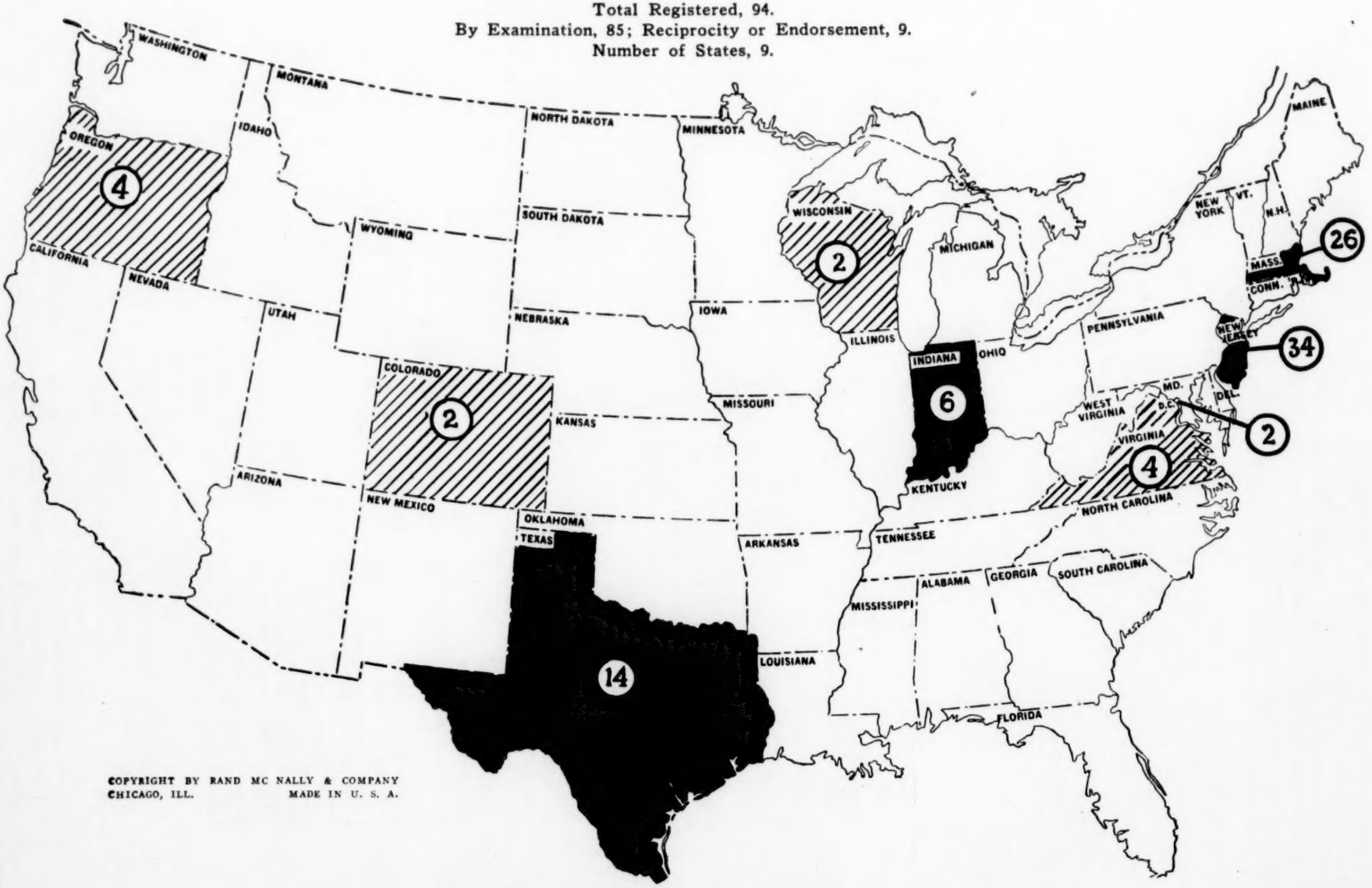
The greatest percentage of failures occurred in Massachusetts, which had an average of 48.2. The high percentage in this state is due to the fact that by law the licensing board is required to admit to its examination the graduates of unapproved schools, the majority of whom repeatedly fail. New York had a failure percentage of 40.5, occasioned in part by the admittance to examination of a large number of graduates of foreign faculties of medicine, who likewise repeatedly failed. On the other hand, twenty-eight states failed less than 5 per cent; in twelve of these the percentage of failures was less than 1. In five years seven states—Arkansas, Nebraska, North Carolina, Oklahoma, Oregon, Utah, and Wisconsin—had no failures.

A total of 37,985 were examined from 1937 to 1941 inclusive, of whom 32,006 passed and 5,979, 15.7 per cent, failed.

These figures represent examinations given and not individuals. A candidate who fails more than once in a given year in a state is counted as only 1 failure, but should he fail in one of the succeeding years he is counted in that year also. The same is true of the successful candidates. This table is merely a compilation of figures computed annually and grouped for comparison. This table gives a fair approximation of the number of physicians added to the profession in

CHART 2.—MEDICAL EXAMINING BOARDS REGISTERING OSTEOPATHS TO PRACTICE SURGERY OR MEDICINE AND SURGERY. 1941

Total Registered, 94.
By Examination, 85; Reciprocity or Endorsement, 9.
Number of States, 9.



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The states in black registered more than 5 such candidates, those shaded 5 or less.

five years by means of written examination. On page 162 is a compilation giving exact figures for the period of 1935 to 1941 inclusive.

REGISTRATION, 1904-1941

A study of totals and percentages for thirty-eight years (1904-1941) will be found in table 24. This tabulation includes figures for each year covering the number examined and passed, the percentage failed, the number registered by reciprocity or endorsement and the total registered. No decided increase was evidenced from 1904 to 1935. However, in 1936 and in the following two years there was a noticeable increase, while since 1938 the number registered has decreased. The number registered without examination has increased considerably since 1904, owing to the wider recognition of reciprocal relations and the acceptance of the certificate of the National Board of Medical Examiners. The decrease of more than 1,200 in 1918 was due to the sudden withdrawal of physicians and recent graduates from civilian life during the World War. However, in the following year the number registered was 2,389 greater than in 1918. The same situation prevailed in 1941, when 385 fewer were registered, although this decrease is also due in part to the fewer graduates of European schools registered as compared with several preceding years.

TABLE 23.—*Candidates Examined, 1937-1941*

	1937		1938		1939		1940		1941		Totals for 5 Years		
	P	F	P	F	P	F	P	F	P	F	P	F	% F
Alabama	26	1	29	0	14	0	26	0	25	3	120	4	3.2
Arizona	14	2	15	0	11	1	20	1	17	0	77	4	4.9
Arkansas	48	0	72	0	68	0	58	0	60	0	306	0	0.0
California	349	20	402	15	383	19	396	29	400	11	1,930	94	4.6
Colorado	76	3	78	3	69	3	75	4	54	4	352	17	4.6
Connecticut	80	21	73	24	53	47	53	33	80	36	339	161	32.2
Delaware	14	2	14	0	11	2	15	0	18	0	72	4	5.3
Dist. Columbia	41	0	33	0	54	0	49	2	33	0	210	2	0.9
Florida	164	38	158	41	172	27	131	6	143	7	763	119	13.5
Georgia	83	0	72	0	90	0	88	0	94	2	427	2	0.5
Idaho	20	0	28	0	24	8	40	1	30	0	142	9	6.0
Illinois	488	5	490	12	523	18	542	24	474	46	2,517	105	4.0
Indiana	125	2	110	1	112	0	125	0	120	0	592	3	0.5
Iowa	88	0	94	11	104	2	67	5	67	2	420	20	4.5
Kansas	82	0	93	1	85	0	92	0	92	0	444	1	0.2
Kentucky	81	1	81	1	88	0	77	0	84	0	411	2	0.5
Louisiana	174	1	184	2	153	0	154	1	145	1	810	5	0.6
Maine	58	2	39	7	42	6	32	14	38	12	209	41	16.4
Maryland	209	27	227	38	187	16	175	18	177	9	975	108	10.0
Massachusetts	302	218	207	220	277	257	338	299	252	287	1,376	1,281	48.2
Michigan	211	1	226	1	217	0	247	0	239	0	1,140	2	0.2
Minnesota	219	0	219	2	217	1	196	0	240	0	1,091	3	0.3
Mississippi	22	2	31	1	21	0	42	0	38	0	154	3	1.9
Missouri	168	12	174	3	211	0	179	0	196	0	928	15	1.6
Montana	4	1	11	0	11	0	9	0	7	1	42	2	4.5
Nebraska	79	0	85	0	78	0	84	0	92	0	418	0	0.0
Nevada	5	0	5	0	4	0	3	1	5	2	22	3	12.0
New Hampshire	18	0	17	0	14	2	9	1	10	1	68	4	5.6
New Jersey	250	33	281	53	237	109	179	36	157	29	1,104	260	19.1
New Mexico	2	0	2	0	2	0	0	1	2	0	8	1	11.1
New York	1,072	291	1,078	372	1,024	695	956	1,088	888	968	5,018	3,414	40.5
North Carolina	83	0	85	0	57	0	65	0	54	0	344	0	0.0
North Dakota	13	0	15	2	17	1	24	0	15	1	84	4	4.6
Ohio	347	5	342	11	369	15	305	16	263	14	1,626	61	3.6
Oklahoma	49	0	46	0	43	0	47	0	54	0	239	0	0.0
Oregon	58	0	54	0	26	0	33	0	22	0	193	0	0.0
Pennsylvania	529	4	512	9	548	10	478	24	446	18	2,513	65	2.5
Rhode Island	38	7	26	1	25	0	19	0	22	0	130	8	5.8
South Carolina	46	1	39	1	48	0	41	0	45	0	219	2	0.9
South Dakota	17	2	8	0	15	0	7	0	9	0	56	2	3.4
Tennessee	208	1	179	3	193	0	188	1	199	4	967	9	0.9
Texas	181	19	200	26	208	15	209	25	177	13	975	98	9.1
Utah	10	0	14	0	17	0	9	0	15	0	65	0	0.0
Vermont	26	0	26	1	17	0	21	1	18	0	108	2	1.8
Virginia	150	2	127	0	113	1	142	1	146	3	678	7	1.0
Washington	57	0	72	0	59	1	48	0	69	1	305	2	0.7
West Virginia	60	1	65	1	33	0	38	0	34	0	230	2	0.9
Wisconsin	118	0	115	0	111	0	113	0	120	0	577	0	0.0
Wyoming	2	1	7	0	8	1	16	1	8	0	41	3	6.8
U. S. Terr. & Possessions	40	4	34	9	30	4	30	2	37	6	171	25	12.8
Total Examined	7,334		7,461		7,754		7,925		7,511		37,985		
Passed	6,604		6,589		6,493		6,290		6,030		32,006		
Failed	730		872		1,261		1,635		1,481		5,979		
Percentage Failed	10.0		11.7		16.3		20.6		19.7		15.7		

The greatest number registered in thirty-eight years was in 1937, 9,807, of whom 6,604 passed licensing tests and 3,203 were endorsed for registration.

The percentage of failures annually dropped from 19.3 in 1904, when a great many proprietary medical schools were fluctuating, to 5.7 per cent in 1930.

TABLE 24.—*Registration, 1904-1941*

Year	All Candidates Examined			Reciprocity or Endorsement	Total Registered
	Examined	Passed	Percentage Failed		
1904	7,056	5,693	19.3	1,005	6,698
1905	7,178	5,688	20.8	394	6,082
1906	8,040	6,373	20.7	1,502	7,875
1907	7,279	5,731	21.3	1,427	7,158
1908	7,775	6,089	21.7	1,284	7,373
1909	7,295	5,865	19.6	1,381	7,246
1910	7,011	5,719	18.4	1,640	7,359
1911	6,964	5,582	19.8	1,243	6,825
1912	6,880	5,467	20.5	1,273	6,740
1913	6,453	5,253	18.6	1,292	6,545
1914	5,579	4,379	21.5	1,439	5,818
1915	5,334	4,507	15.5	1,399	5,906
1916	4,878	4,151	14.9	1,353	5,504
1917	4,753	4,084	14.1	1,360	5,444
1918	3,667	3,184	13.2	1,047	4,231
1919	4,750	4,074	14.2	2,546	6,620
1920	4,796	4,062	15.3	2,558	6,620
1921	4,825	4,228	12.4	2,186	6,414
1922	4,031	3,539	12.2	2,073	5,612
1923	4,727	4,028	14.8	2,405	6,433
1924	5,392	4,756	11.8	1,922	6,678
1925	6,902	5,450	9.2	1,861	7,311
1926	5,770	5,314	7.9	1,955	7,269
1927	5,389	5,002	7.2	2,176	7,178
1928	5,458	5,090	6.7	2,228	7,318
1929	5,629	5,282	6.2	2,420	7,702
1930	5,571	5,255	5.7	2,366	7,621
1931	5,611	5,263	6.2	2,211	7,476
1932	5,675	5,247	7.6	1,885	7,132
1933	5,673	5,244	7.6	1,989	7,233
1934	6,144	5,627	8.4	2,160	7,788
1935	6,443	5,859	9.1	2,196	8,055
1936	6,917	6,223	10.0	2,775	8,998
1937	7,334	6,604	10.0	3,203	9,807
1938	7,461	6,589	11.7	2,956	9,545
1939	7,754	6,493	16.3	2,872	9,365
1940	7,925	6,290	20.7	2,863	9,153
1941	7,511	6,030	19.7	2,738	8,768

Improvement in the standards of medical education is largely responsible for the decrease in failures before licensing examinations. With the migration of physicians to this country beginning in 1936 and their failure to pass examinations, the percentage of failures began to rise until it reached a peak of 20.7 in 1940. In 1941 it dropped 1 per cent for the country as a whole in spite of the high percentage of failures in New York State. The rise in failure percentages has also been due to the inability of graduates of unapproved medical schools to obtain licensure successfully without failure.

While these figures represent those registered in the years given, they do not represent actual additions to the medical profession even among those who tried the written examination.

GRADUATES OF APPROVED SCHOOLS AND OTHERS REGISTERED, 1922-1941

The educational fitness of the individuals registered in twenty years is recorded in table 25. In the computation of these figures, schools rated as class A and B by the Council on Medical Education and Hospitals of the American Medical Association since 1907 are classified as approved. In the column "others" are included graduates of institutions prior to 1907, of foreign faculties of medicine, class C graduates, osteopaths given recognition by medical licensing boards and graduates of schools not approved by the Council. In 1928 the classification A, B and C by the Council was discontinued and medical schools have since been classified as approved or unapproved.

CHART 3.—STATES REGISTERING GRADUATES OF MEDICAL FACULTIES ABROAD, 1941

Total Registered, 737.
By Examination, 685; Reciprocity or Endorsement, 52.
Number of States, 28.

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The states in black registered more than 5 such candidates, those shaded 5 or less.

Of the 8,768 registered by all methods in 1941, 7,727, 88.1 per cent, represented graduates of approved medical schools and 1,041, 11.9 per cent, the group designated as others.

In twenty years a total of 156,442 were registered, including 138,287 approved graduates, 88.4 per cent, and 18,155 others, 11.6 per cent. The improved standards of medical education are again evident in a study of these totals and in the percentages representing approved graduates. The number of graduates of approved schools in the period shown has always been in the bracket above 4,000, representing more than 80 per cent of those annually registered. The recognition of graduates of approved schools by licensing boards and the consistent refusal of many state boards to recognize graduates from unapproved schools is revealed in the number of others registered. Until the influx of foreign graduates in 1936 the number in this second group has always been well below 1,000.

TABLE 25.—*Graduates of Approved Schools and Others Registered, 1922-1941*

Year	Graduates of Approved Schools		Others		Totals
	Number	Per Cent	Number	Per Cent	
1922	4,519	80.5	1,093	19.5	5,612
1923	5,196	80.8	1,237	19.2	6,433
1924	5,686	85.2	992	14.8	6,678
1925	6,314	86.4	997	13.6	7,311
1926	6,441	88.7	828	11.3	7,269
1927	6,410	89.4	768	10.6	7,178
1928	6,585	90.1	733	9.9	7,318
1929	7,003	91.0	699	9.0	7,702
1930	7,011	92.1	610	7.9	7,621
1931	6,932	92.8	544	7.2	7,476
1932	6,675	93.7	457	6.3	7,132
1933	6,774	93.7	459	6.3	7,233
1934	7,171	92.1	617	7.9	7,788
1935	7,362	91.5	693	8.5	8,055
1936	7,932	88.2	1,066	11.8	8,998
1937	8,389	85.6	1,418	14.4	9,807
1938	8,315	87.1	1,230	12.9	9,545
1939	8,067	86.2	1,298	13.8	9 365
1940	7,778	85.0	1,375	15.0	9,153
1941	7,727	88.1	1,041	11.9	8,768
Totals	138,287	88.4	18,155	11.6	156 442

TABLE 26.—*Graduates of Unapproved Medical Schools Registered, 1936-1941*

	Examination						Reciprocity and Endorsement						
	1936	1937	1938	1939	1940	1941	1936	1937	1938	1939	1940	1941	Total
Arizona	0	2	1	2	0	0	0	0	0	0	0	0	5
Arkansas	0	0	1	0	0	0	0	0	1	0	0	0	2
California	0	0	0	0	1	1	0	0	0	1	0	0	3
Florida	1	2	2	1	0	0	0	0	0	0	0	0	6
Illinois	84	82	60	51	48	51	0	0	0	0	0	0	376
Indiana	0	0	0	0	0	0	0	0	3	1	2	0	6
Iowa	0	0	0	0	0	0	0	0	0	0	0	1	1
Kentucky	0	0	0	0	0	0	2	2	1	2	2	0	9
Massachusetts	77	97	58	79	98	89	0	0	0	0	0	0	498
Missouri	0	0	0	0	0	1	0	0	1	0	0	0	2
Nebraska	0	0	0	0	0	0	0	1	0	0	0	0	1
New Jersey	5	1	7	0	0	0	1	2	4	4	13	8	45
New Mexico	1	0	1	0	0	0	1	0	2	0	2	0	7
New York	0	0	0	0	0	0	13	14	8	12	8	0	55
North Carolina	1	2	0	0	0	0	0	0	0	0	0	0	3
Ohio	31	23	32	36	0	0	0	0	0	0	0	0	122
Pennsylvania	0	1	4	1	5	0	0	0	0	0	0	0	11
Texas	0	0	1	4	6	0	0	3	0	0	0	0	14
Virginia	0	1	0	1	0	0	0	0	0	0	0	0	2
Wisconsin	0	0	0	0	0	0	1	0	0	0	0	0	1
Alaska, Hawaii and Puerto Rico	1	1	0	0	1	1	1	0	0	0	0	0	5
Totals	201	212	167	175	159	143	19	22	20	20	27	9	1,174

Of the 8,768 registered in 1941 there were 5,112 who were graduates of approved medical schools of the United States and Canada licensed by examination and 2,615 licensed without examination. By examination, 221 unapproved graduates and 697 foreign graduates were registered. Likewise among those registered by endorsement there were 24 graduates of unapproved schools and 99 foreign graduates.

New York registered 735 graduates of approved schools of a total of 1,175 registered. This state licensed the largest number with foreign credentials, 439. Only graduates of approved schools in the United States and Canada were registered in Kansas, Minnesota, Nebraska, Nevada, North Dakota, South Carolina and South Dakota.

GRADUATES OF UNAPPROVED MEDICAL SCHOOLS REGISTERED, 1936-1941

Data regarding the number of graduates of those institutions which do not meet the standards outlined by the House of Delegates of the American Medical Association and enforced by the Council on Medical Education and Hospitals who were registered as medical licentiates in the United States, Alaska, Hawaii and Puerto Rico with or without examination from 1936 to 1941 inclusive are recorded in table 26.

In the six years shown, twenty states, Alaska, Hawaii and Puerto Rico registered 1,057 by examination and 117 by reciprocity or endorsement. In 1941 there were 152 registered in six states, namely California, Illinois, Iowa, Massachusetts, Missouri and New Jersey. Two states, Illinois and Massachusetts, registered 140 of the 152 reported. These statistics include 8 graduates of a school recently dissolved and from which the Council has removed inhibitions formerly made regarding this school. However, they were licensed during the period when the school was not recognized as an approved institution. Chart 1, on page 164, records graphically the number so registered, indicating by shaded lines those states registering fewer than 6 graduates of unapproved schools and by a solid area those registering more than 5 such candidates during 1941.

TABLE 27.—*Graduates of Schools of Osteopathy Registered by Medical Examining Boards, 1936-1941*

	Examination						Reciprocity and Endorsement						
	1936	1937	1938	1939	1940	1941	1936	1937	1938	1939	1940	1941	Total
Colorado	16	19	18	22	15	2	0	0	0	0	0	0	92
Connecticut	1	1	0	1	0	0	0	0	0	0	0	0	3
Dist. Columbia	0	0	1	0	1	0	0	0	0	0	0	2	4
Indiana	2	2	2	4	7	3	1	1	0	0	1	3	26
Massachusetts	12	18	10	10	27	26	0	0	0	0	0	0	103
New Hampshire	1	4	2	0	2	0	0	2	1	0	2	0	14
New Jersey	0	52	46	45	47	34	0	0	0	0	0	0	224
Oregon	1	1	1	1	0	2	2	0	1	1	1	2	13
Texas	11	17	22	19	20	13	34	72	37	17	1	1	264
Virginia	4	2	1	0	0	3	0	0	0	0	0	1	11
Wisconsin	3	1	0	0	1	2	5	2	3	0	0	0	17
Wyoming	0	0	0	0	1	0	4	4	1	2	0	0	12
Totals	51	117	103	102	121	85	46	81	43	20	5	9	783

GRADUATES OF SCHOOLS OF OSTEOPATHY REGISTERED BY MEDICAL EXAMINING BOARDS, 1936-1941

The number of graduates of schools of osteopathy granted the privilege of practicing medicine, surgery or both by medical examining boards from 1936 to 1941 inclusive are given in table 27. Osteopaths licensed by osteopathic boards and given medical privileges in some form are not included in these statistics. Likewise, excluded are osteopaths licensed by medical boards to practice osteopathy only.

In six years twelve states recognized such individuals and 783 were registered, 579 by examination and 204 by endorsement of credentials.

(CONTINUED ON PAGE 172)

TABLE 28.—*Physicians Examined on the Basis of Credentials Obtained in Countries Other Than the United States and Canada, 1941*

Marginal Number		1 California		2 Connecticut		3 Idaho		4 Illinois		5 Indiana		6 Maine		7 Maryland		8 Massachusetts		9 Montana		10 New Hampshire		11 New Jersey		12 New York		13 Ohio		14 Pennsylvania		15 Rhode Island		16 Texas		17 Utah		18 Vermont		19 Virginia		20 Washington		21 Alaska and Puerto Rico		Totals	Examined—Passed	Examined—Failed	Percentage of Failures	No. of Boards Examined by	Marginal Number
		P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F						
	BELGIUM																																															
1	Université Libre de Bruxelles	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	1	50.0	2	1
	CHINA																																															
2	Pennsylvania Medical School, Shanghai	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	100.0	1	2
	CUBA																																														
3	Universidad de la Habana	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	1	0	1	100.0	1	3
	CZECHOSLOVAKIA																																														
4	Deutsche Universität, Prag	1	0	0	1	..	..	4	1	..	..	..	..	..	..	2	4	..	..	..	..	..	..	10	20	..	..	3	0	..	..	..	..	..	..	..	..	1	1	..	..	..	..	48	21	27	56.3	7	4
5	Universita Karlova, Praha	0	1	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	15	2	13	86.7	3	5
6	Univerzita Komenského, Bratislava	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	2	3	60.0	2	6
	DENMARK																																														
7	Københavns Universitet	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	100.0	1	7
	ENGLAND																																														
8	Licentiate in Medicine, Surgery and Midwifery of the Apothecaries' Society of London	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	1	50.0	1	8
9	Licentiate of the Royal College of Physicians of London and Member of the Royal College of Surgeons of England	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	6	3	33.3	1	9
10	London Hospital Medical College	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	100.0	1	10
11	St. Bartholomew's Hospital Medical College	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	0	0.0	1	11
12	University of Cambridge	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	0	0.0	1	12
13	University of London	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	0	0.0	1	13
	FRANCE																																														
14	Université de Bordeaux	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	0	0.0	1	14
15	Université de Lyon	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	1	0	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	2	1	33.3	3	15
16	Université de Montpellier	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	1	50.0	1	16
17	Université de Nancy	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	2	2	50.0	1	17
18	Université de Paris	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	5	12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	21	7	14	66.7	3	18
	GERMANY																																														
19	Albert-Ludwigs-Universität, Freiburg	..	..	1	0	..	..	2	1	..	..	1	0	0	1	1	3	..	..	..	..	..	..	8	13	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	0	..	..	33	15	18	54.5	8	19
20	Albertus-Universität, Königsberg	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	3	8	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	13	5	8	61.5	3	20
21	Christian-Albrechts-Universität, Kiel	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	8	3	5	62.5	1	21
22	Eberhard-Karls-Universität, Tübingen	..	..	..	..	..	..	1	0	..	..	..	..	..	..	0	1	..	..	..	..	..	..	0	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	1	4	20.0	3	22
23	Ernst-Moritz-Arndt Universität, Greifswald	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	2	..	..	1	0	0	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	1	4	20.0	3	23
24	Friedrich-Alexanders-Universität, Erlangen	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	0	2	100.0	1	24
25	Friedrich-Wilhelms-Universität, Berlin	2	0	1	0	..	..	8	5	..	..	..	..	1	1	4	11	..	..	..	..	0	1	34	65	3	1	..	..	1	0	..	..	..	..	..	..	1	0	..	..	..	..	139	55	84	60.4	10	25
26	Georg August-Universität, Göttingen	..	..	..	..	..	..	0	1	..	..	..	..	..	..	0	1	..	..	..	..	..	..	0	5	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	8	1	7	87.5	4	26
27	Hamburgische Universität	1	0	..	..	..	..	1	1	..	..	..	..	0	2	0	1	..	..	..	..	..	..	6	6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	18	8	10	55.6	5	27
28	Hessische Ludwigs-Universität, Giessen	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	1	6	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	2	7	77.8	3	28
29	Johann Wolfgang Goethe-Universität, Frankfurt-am-Main	2	0	1	0	..	..	3	3	..	..	..	..	0	1	0	1	..	..	..	..	..	..	7	11	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	30	13	17	56.7	7	29
30	Julius-Maximilians-Universität, Würzburg	..	..	..	..	..	..	2	3	..	..	..	..	..	..	0	3	..	..	..	..	..	..	12	21	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	42	14	28	66.7	4	30
31	Kaiser-Wilhelms-Universität, Strassburg	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	11	5	6	54.5	2	31
32	Karl-Franzens-Universität, Graz	..	..	0	1	..	..	..	..	..	..	..	..	..	..	0	2	..	..	..	..	..	..	3	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	10	3	7	70.0	3	32
33	Leopold-Franzens-Universität, Innsbruck	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	0	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6	0	6	100.0	2	33
34	Ludwig-Maximilians-Universität, München	2	0	1	3	..	..	1	0	..	..	..	..	1	0	3	5	..	..	..	..	..	..	18	33	1	0	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	69	28	41	59.4	8	34
35	Medizinische Akademie Düsseldorf	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	2	1	33.3	2	35
36	Philipps-Universität, Marburg	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	1	0	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	3	2	40.0	3	36
37	Rheinische Friedrich-Wilhelms-Universität, Bonn	1	1	..	..	1	0	2	0	..	..	..	..	..	..	1	1	..	..	..	..	..	..	4	9	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	22	10	12	54.5	6	37
38	Schlesische-Friedrich-Wilhelms-Universität, Breslau	2	0	..	..	..	..	1	1	..	..	..	..	..	..	2	4	..	..	..	..	..	..	6	17	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	35	12	23	65.7	5	38
39	Thüringische Landesuniversität, Jena	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	1	3	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6	1	5	83.3	3	39
40	Universität Heidelberg	3	0	2	2	..	..	1	0	..	..	..	..	..	..	0	3	..	..	..	..	1	0	13	20	3	1	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	50	24	26	52.0	8	40
41	Universität Köln	..	..	..	..	..	..	1	1	..	..	..	..	..	..	0	1	..	..	..	..	..	..	1	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	8	2	6	75.0	3	41
42	Universität Leipzig	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	3	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	4	5	55.6	2	42
43	Universität Rostock	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	6	3	3	50.0	2	43
44	Universität Wien	12	1	4	11	..	..	24	10	1	0	3	3	2	0	7	31	..	..	..	..	2	3	132	211	3	3	8	0	..	..	..	..	..	..	..	..	5	0	2	0	1	0	479	206	273	57.0	14	44
45	Vereinigten Friedrichs-Universität, Halle-Wittenberg	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	1	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7	1	6	85.7	2	45
	GREECE																																														
46	National University of Athens	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	4	1	3	75.0	3	46
	HUNGARY																																														
47	Magyar Királyi Erzsébet Tudományegyetem, Pecs	1	0	..	..	..	..	2	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..						
48	Magyar Királyi Pázmány Péter Tudományegyetem, Budapest	1	0	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..						

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TABLE 28.—*Physicians Examined on the Basis of Credentials Obtained in Countries Other Than the United States and Canada, 1941—Continued*

Marginal Number	UNION OF SOCIALIST SOVIET REPUBLICS	California		Connecticut		Idaho		Illinois		Indiana		Maine		Maryland		Massachusetts		Montana		New Hampshire		New Jersey		New York		Ohio		Pennsylvania		Rhode Island		Texas		Utah		Vermont		Virginia		Washington		Alaska and Puerto Rico		Totals		Examined—Passed	Examined—Failed	Percentage of Failures	No. of Boards Examined by	Marginal Number
		1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16		17		18		19		20		21						
		P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F							
100	First Moscow Medical Institute																							0	1																	1	0	1	100.0	1	100
101	Second Leningrad Medical Institute													0	1																					0	1					2	0	2	100.0	2	101
102	Tomsk Medical Institute																							1	0																	1	1	0	0.0	1	102
103	Vinnitsa Medical Institute															0	1																									1	0	1	100.0	1	103
104	Voronezh Medical Institute															1	0							0	1																	2	1	1	50.0	2	104
105	Totals	39	41	1	119	1	15	22	139	2	1	42	1,207	25	21	1	1	1	15	5	9	1,708	...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	105
106	Totals—Examined—Passed	35	13	1	78	1	9	14	37	2	1	20	426	15	13	1	0	1	12	5	5	680	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	106
107	Totals—Examined—Failed	4	28	0	41	0	6	8	102	0	0	22	781	10	8	0	1	0	3	0	4	.....	...	1,018	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	107
108	Percentage Failed	10.3	68.3	0.0	34.5	0.0	40.0	36.4	73.4	0.0	0.0	52.4	64.7	40.0	38.1	0.0	100.0	0.0	20.0	0.0	44.4	.....	...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	59.6	..	108

(CONTINUED FROM PAGE 169)

In 1941 nine states registered 85 by examination and 9 by endorsement of credentials, a total of 94. The number for each state so registered in 1941 is shown graphically in chart 2, page 166, indicating by shaded lines those registering fewer than 6 graduates of osteopathic schools and by a solid area more than 5 such candidates. Massachusetts, New Jersey and Texas registered 74 of the 94 so licensed. Colorado prior to 1941 was one of the four states recognizing the greatest number of such graduates, but in 1941 only 2 were licensed.

In six years Texas registered 264, New Jersey 224, Massachusetts 103 and Colorado 92, a total of 683. In six years eight other states licensed altogether 100.

The situation in these states whereby the medical board is by law required to recognize such graduates is as follows:

In Colorado osteopaths have no separate board. They are admitted to examination under the medical practice act for a license to practice medicine. In Connecticut, any registered osteopath may practice either medicine, surgery or both, as the case may be, after passing a satisfactory examination before the medical examining board.

In Indiana the licenses issued to osteopaths authorize the holders to practice osteopathy, surgery and obstetrics.

In Massachusetts the medical practice act, by definition, includes osteopathy in the practice of medicine and does not differentiate the type of license issued to an osteopathic applicant. The act requires that any applicant for license to practice must be in possession of a degree of doctor of medicine, or its equivalent, from a legally chartered medical school which gives a full four year course of instruction of not less than thirty-two weeks in each year.

In New Hampshire, osteopaths are granted the right to practice medicine and surgery by the Board of Registration in Medicine.

In New Jersey, osteopaths licensed prior to Nov. 1, 1941 who furnished proof, prior to that date, of having served for a period of two years as an intern or resident surgeon in an osteopathic or medical hospital approved by the state board of medical examiners, of having completed a postgraduate course of two years in a college of osteopathy or medicine approved by the board or of having had at least three years of practice in a hospital approved by the board could be admitted to an examination in pharmacology, therapeutics and surgery and, if the examination was passed, could obtain a license to practice medicine and surgery. Since Nov. 1, 1941 all osteopathic applicants who have met the requirements of the medical practice act have received licenses to practice medicine and surgery.

The medical practice act of Texas provides for the issuing of a license to practice medicine only. Osteopaths are issued licenses unrestricted in scope.

In Virginia, osteopaths may obtain the right to "perform surgery with the use of instruments" if they satisfy the board of medical examiners that they have had "adequate clinical facilities in their respective college of graduation, or by hospital work to enable them to perform such operations."

In Wyoming the statutes contain no specific provision for the licensing of osteopaths. The medical practice act provides that the certificates issued to all applicants

"shall be deemed licenses to practice medicine in all branches in which the applicant has taken examination in this state."

In the District of Columbia, Oregon and Wisconsin osteopaths are granted the right to practice surgery.

PHYSICIANS EXAMINED ON BASIS OF CREDENTIALS OBTAINED IN COUNTRIES OTHER THAN THE UNITED STATES AND CANADA

The requirements of candidates for medical licensure in the United States, Alaska, Hawaii and Puerto Rico on the basis of credentials obtained in countries other than in the United States and Canada, based on data recently received from state boards of medical examiners, are given in table 29. Eighteen states report that, because of the inability to evaluate foreign credentials, holders of such certificates are not eligible for licensure, while one state reported that no new applications have been accepted since Feb. 21, 1941. Seventeen states, Alaska, Hawaii and Puerto Rico require full citizenship and ten states first naturalization papers as a condition precedent to taking the examination. In some states the requirement is by rule of the medical board, in others the provision is by statute. In addition, other restrictions are imposed. Ten states which accept foreign graduates require a certificate in the basic sciences. Sixteen states, Alaska, Hawaii and Puerto Rico require a one year internship in a United States Hospital approved for intern training. In five states there is a requirement of a senior year's work in an approved medical school in the United States. In four states these graduates are not acceptable unless they can present a license to practice medicine and surgery in the country in which the school of graduation is located. In one state a limited number contracting to practice in rural districts may be accepted, while another reports that enemy aliens are not considered.

Table 28 presents figures regarding physicians examined on the basis of credentials obtained in countries other than the United States and Canada by licensing boards of the United States, Alaska and Puerto Rico. The figures represent both American and foreign born physicians educated abroad. Since 1930 and until the issuance of passports was terminated by the Department of State students from the United States migrated to Europe to obtain a medical education. It is estimated that 2,000 were so studying in Europe. Many were able to complete their training and returned to the United States to practice. Many of those licensed in recent years represent foreign born physicians. One hundred and four faculties of medicine, including four licensing corporations, of nineteen European and five other countries were represented. There were 1,708 examined by twenty states, Alaska and Puerto Rico, of whom 690 passed and 1,018, 59.6 per cent, failed. Graduates of the University of Vienna represented the largest group, 479, who were examined in fourteen states with a percentage of failures of 57. Ten states examined 139 graduates of the University of Berlin, of whom 60.4 per cent failed. Graduates of all other schools were examined in fewer than ten states. The greatest number examined by any one state (1,207) were in New York, of whom 426 passed and 64.7 per cent failed. Massachusetts examined 139, of whom 102, 73.4 per cent, failed. Illinois examined 119, of whom 34.5 per cent failed. More than 25 were examined in 1941 in California, Connecticut and New Jersey. Of

TABLE 29.—*Requirements of Candidates for Medical Licensure on the Basis of Credentials Obtained in Countries Other Than the United States and Canada*

	Admitted to Examination	Admitted by Endorsement of State License*	Citizenship	Basic Science Certificate	Internship in Hospital in United States	Further Medical Training	Examination Fee, Dollars	Other Requirements
Alabama	+	..	+	..	+	..	10	1
Arizona	Not accepted							
Arkansas (reg. and homeo. boards)	Not accepted							
California	+	+[21]	..	..	+[18]	+[18]	25	11
Colorado	+	..	1st P	+	..	..	25[4]	3
Connecticut (regular board)	+	..	1st P	+	..	..	25	..
Delaware (regular board)	+	..	+	..	+	..	25	5,22
District of Columbia	..	+[6]	..	+	+	..	25	10
Florida	+	..	+	+	..	+[7]	25	..
Georgia	+	..	+	..	..	+[7]	20	..
Idaho	+	..	+	..	+	..	25	..
Illinois	+	..	1st P	..	+	..	15	8
Indiana	+	+	..	..	..	+[7]	25	..
Iowa	+[10]	..	+	+	+[2]	+[2]	25	..
Kansas	+	..	+	..	..	..	25	11
Kentucky	Not accepted							
Louisiana (reg. and homeo. boards)	Not accepted							
Maine	+	+	1st P	..	+	..	27	11
Maryland (reg. and homeo. boards)	+	..	1st P	..	..	..	25	10
Massachusetts	+	..	1st P	..	..	..	25	..
Michigan	+	+	+	+	+	+[7]	25	..
Minnesota	Not accepted							
Mississippi	Not accepted							
Missouri	+	+	+	..	..	..	15	..
Montana	+	+	+	..	..	..	50	..
Nebraska	+	+	+	+	..	..	25	..
Nevada	Not accepted							
New Hampshire	+	+[12]	+	..	+[14]	..	20	15
New Jersey	+	+	+	..	+[17]	..	25	..
New Mexico	Not accepted							
New York	+	+	1st P	..	..	..	25	..
North Carolina	Not accepted							
North Dakota	+	..	+	..	+	..	25	11
Ohio	+	+	+	..	..	..	25	..
Oklahoma	Not accepted							
Oregon	+	..	..	+	+	+	25	..
Pennsylvania	+	..	1st P	..	+	..	25	..
Rhode Island	+	..	1st P	+	+[16]	+[16]	20	13
South Carolina	Not accepted							
South Dakota	Not accepted							
Tennessee	Not accepted							
Texas	+	+	+	..	..	..	25	..
Utah	Not accepted							
Vermont	Not accepted[23]							
Virginia	+	..	+	..	..	..	25	24
Washington	+	..	1st P	+	+	+[7]	25	9
West Virginia	Not accepted							
Wisconsin	Not accepted							
Wyoming	Not accepted							
Alaska	+	+	+	..	+	..	25	..
Hawaii	+	..	+	..	+	..	25	12
Puerto Rico	+	+	+	..	+	..	25	..

* Refer to chart of "Reciprocity and Endorsement Policies" for further data.

1. Certificate of National Board of Medical Examiners and licensure in country in which school of graduation is located.
2. Internship or one year in medical school in United States.
3. Certificate of National Board of Medical Examiners.
4. For graduates of last five years; if more than five years $50.
5. Residence of one year in Delaware.
6. Provided similar privileges are accorded licentiates of District of Columbia by licensing agency of the jurisdiction from which the applicant comes.
7. Senior year in class A medical school in United States.
8. No applications accepted after Feb. 21, 1941.
9. Enemy aliens not accepted.
10. Application must be filed six months prior to date of examination.
11. Licensed to practice medicine and surgery in country in which school of graduation is located, otherwise required to complete senior year in approved medical school in United States.
12. Diplomates of National Board of Medical Examiners eligible.
13. License to practice medicine and surgery in the country in which the school of graduation is located.
14. Internship and one year graduate work.
15. Diplomates of the National Board of Medical Examiners exempt from special requirements.
16. Internship and graduate work.
17. Internship completed in foreign countries after July 1, 1934 not acceptable.
18. Rotating internship in approved hospital in the United States or completion of senior year in class A medical school in the United States.
19. These requirements apply also to graduates of Canadian schools.
20. Graduates from foreign medical colleges accepted if they present also a diploma from an approved medical school in the United States.
21. Provided standard was the same as California on the same date.
22. Degree from an American medical college acceptable to the Medical Council of Delaware required.
23. Diplomates of the National Board of Medical Examiners accepted.
24. Very limited number contracting to practice in rural districts may be accepted.

TABLE 30.—*Physicians Examined on the Basis of Credentials Obtained in Countries Other Than the United States and Canada by Licensing Boards of the United States and Possessions, 1936-1941*

	1936-1940		1941	
	Number Examined	Percentage Failed	Number Examined	Percentage Failed
AUSTRALIA				
University of Sydney	1	0.0	0	0.0
BELGIUM				
Université de Liege	4	50.0	0	0.0
Université Libre de Bruxelles	11	18.2	2	50.0
Universiteit Gent	4	75.0	0	0.0
CHILE				
Universidad de Chile, Santiago	1	0.0	0	0.0
CHINA				
Pennsylvania Medical School, Shanghai	6	16.7	1	100.0
Woman's Christian Medical College, Shanghai	1	0.0	0	0.0
CUBA				
Universidad de la Habana	6	66.7	1	100.0
CZECHOSLOVAKIA				
Deutsche Universität, Prag	128	46.9	48	56.3
Masarykova Universita, Brno	4	50.0	0	0.0
Universita Karlova, Praha	30	66.7	15	86.7
Univerzita Komenského, Bratislava	5	20.0	5	60.0
DENMARK				
Københavns Universitet	1	100.0	1	100.0
ENGLAND				
Charing Cross Hospital Medical School, London	1	0.0	0	0.0
Fellow of the Royal College of Physicians of London	1	0.0	0	0.0
Licentiate in Medicine, Surgery and Midwifery of the Apothecaries' Society of London	6	66.7	2	50.0
Licentiate of the Royal College of Physicians of London and Member of the Royal College of Physicians of London	1	0.0	0	0.0
Licentiate of the Royal College of Physicians of London and Member of the Royal College of Surgeons of England	61	18.0	9	33.3
London Hospital Medical College	0	0.0	1	100.0
Middlesex Hospital Medical School, London	1	0.0	0	0.0
St. Bartholomew's Hospital Medical College	0	0.0	1	0.0
University of Birmingham	3	0.0	0	0.0
University of Bristol	1	0.0	0	0.0
University of Cambridge	2	0.0	1	0.0
University of Durham, Newcastle-upon-Tyne	9	22.2	0	0.0
University of Liverpool	1	0.0	0	0.0
University of London	4	25.0	1	0.0
University of Oxford	2	0.0	0	0.0
University of Sheffield	7	0.0	0	0.0
ESTONIA				
Université de Tartu	3	100.0	0	0.0
FRANCE				
Université de Bordeaux	2	50.0	1	0.0
Université de Lyon	10	50.0	3	33.3
Université de Montpellier	8	25.0	2	50.0
Université de Nancy	9	66.7	4	50.0
Université de Paris	132	37.9	21	66.7
Université de Strasbourg	6	33.3	0	0.0
Université de Toulouse	3	0.0	0	0.0
GERMANY				
Albert-Ludwigs-Universität, Freiburg	121	49.6	33	54.5
Albertus-Universität, Königsberg	75	56.0	13	61.5
Christian-Albrechts-Universität, Kiel	28	46.4	8	62.5
Eberhard-Karls-Universität, Tübingen	29	51.7	5	20.0
Ernst-Moritz-Arndt Universität, Griefswald	3	100.0	5	20.0
Friedrich-Alexanders-Universität, Erlangen	32	59.4	2	100.0
Friedrich-Wilhelms-Universität, Berlin	650	44.9	139	60.4
Georg August-Universität, Göttingen	42	52.4	8	87.5
Hamburgische Universität	89	34.8	18	55.6
Hessische Ludwigs-Universität, Giessen	36	55.6	9	77.8
Johann Wolfgang Goethe-Universität, Frankfurt-am-Main	127	40.2	30	56.7
Julius-Maximilians-Universität, Würzburg	126	52.4	42	66.7
Kaiser-Wilhelms-Universität, Strassburg	30	50.0	11	54.5
Karl-Franzens-Universität, Graz	35	54.3	10	70.0
Leopold-Franzens-Universität, Innsbruck	13	38.5	6	100.0
Ludwig-Maximilians-Universität, München	260	47.7	69	59.4
Medizinische Akademia Düsseldorf	26	42.3	3	33.3
Philipps-Universität, Marburg	13	69.2	5	40.0
Rheinische Friedrich-Wilhelms-Universität, Bonn	92	50.0	22	54.5
Schlesische-Friedrich-Wilhelms-Universität, Breslau	178	41.0	35	65.7
Thüringische Landesuniversitat, Jena	19	47.4	6	83.3
Universität Heidelberg	192	46.4	50	52.0
Universität Köln	48	37.5	8	75.0
Universität Leipzig	82	47.6	9	55.6
Universität Rostock	32	59.4	6	50.0
Universität Wien	1,318	45.7	479	57.0
Vereinigten Friedrichs-Universität, Halle-Wittenberg	32	50.0	7	85.7
Westfalische Wilhelms-Universität, Münster	1	0.0	0	0.0
GREECE				
National University of Athens	19	84.2	4	75.0
GUATEMALA				
Universidad Nacional de Guatemala	1	0.0	0	0.0
HUNGARY				
Magyar Királyi Erzsébet Tudományegyetem, Pecs	35	60.0	19	63.2
Magyar Királyi Ferencz József Tudományegyetem, Szeged	15	66.7	3	33.3
Magyar Királyi Pázmány Petrus Tudományegyetem, Budapest	91	52.7	38	65.8
Magyar Királyi Tisza-István-Tudományegyetem, Debrecen	4	50.0	3	33.3
IRELAND				
Licentiate of the Apothecaries' Hall, Dublin	1	100.0	1	0.0
Licentiate of the Royal College of Physicians of Ireland and Licentiate of the Royal College of Surgeons in Ireland	3	66.7	0	0.0
National University of Ireland	8	37.5	1	100.0
Queen's University, Belfast	1	0.0	2	0.0
University of Dublin	17	29.4	3	100.0
ITALY				
Regia Università di "Benito Mussolini" di Bari	5	80.0	4	50.0
Regia Università di Bologna	129	63.6	47	78.7
Regia Università di Catania	3	33.3	0	0.0
Regia Università di Firenze	25	40.0	5	40.0
Regia Università di Genova	22	81.8	9	88.9
Regia Università di Messina	11	100.0	6	83.3
Regia Università di Milano	22	50.0	12	33.3
Regia Università di Modena	15	80.0	8	75.0
Regia Università di Napoli	163	65.0	34	85.3
Regia Università di Padova	24	58.3	8	62.5
Regia Università di Palermo	17	70.6	5	80.0
Regia Università di Pavia	5	80.0	4	75.0
Regia Università di Perugia	13	53.8	2	100.0
Regia Università di Pisa	28	60.7	13	84.6
Regia Università di Roma	283	53.0	46	71.7
Regia Università di Siena	18	72.2	8	50.0
Regia Università di Torino	11	45.5	17	47.1
JAPAN				
Japan Medical College, Tokyo	5	100.0	0	0.0
LATVIA				
Latvijas Universitäte, Riga	3	100.0	1	0.0
LEBANON				
American University of Beirut	6	0.0	3	33.3
Université de St. Joseph, Beyrouth	2	100.0	2	0.0
MEXICO				
Escuela Libre de Homeopatia del Estado de Puebla	2	100.0	1	100.0
Escuela Médico Militar, México, D. F.	6	83.3	0	0.0
Universidad Libre México Instituto de Ciencias	0	0.0	1	100.0
Universidad Nacional, México, D. F.	12	75.0	1	0.0
NETHERLANDS				
Rijks-Universiteit te Groningen	3	33.3	2	0.0
Rijks-Universiteit te Leiden	1	0.0	2	50.0
Rijks-Universiteit te Utrecht	1	0.0	2	50.0
Universiteit van Amsterdam	4	25.0	11	45.5
NEW ZEALAND				
University of New Zealand	0	0.0	1	0.0
NORWAY				
Kongelige Fredericks Universitet, Oslo	1	0.0	1	100.0
POLAND				
Uniwersytet Jagiellonski, Cracow	1	100.0	2	0.0
Uniwersytet Jana Kazimierza, Lwów	7	42.9	1	100.0
Uniwersytet Jozefa Pilsudskiégo, Warszawa	9	66.7	2	50.0
Uniwersytet Stefana Batorego, Wilno	8	37.5	1	100.0
PORTUGAL				
Universidade de Coimbra	0	0.0	3	33.3
Universidade de Lisboa	1	100.0	1	100.0
RUMANIA				
Universitatea din Bucuresti	2	50.0	0	0.0
Universitatea Regele Ferdinand I-iu din Cluj	3	33.3	0	0.0
SCOTLAND				
Anderson College of Medicine, Glasgow	1	100.0	2	50.0
Fellow of the Royal Faculty of Physicians and Surgeons of Glasgow	1	0.0	0	0.0
Licentiate of the Royal College of Physicians of Edinburgh and Licentiate of the Royal College of Surgeons of Edinburgh	2	0.0	0	0.0
Licentiate of the Royal College of Physicians, of the Royal College of Surgeons, Edinburgh, and of the Royal Faculty of Physicians and Surgeons, Glasgow	284	22.2	65	36.9
School of Medicine of the Royal Colleges, Edinburgh	1	0.0	1	0.0
St. Mungo's College Medical School, Glasgow	1	0.0	0	0.0
University of Aberdeen	4	0.0	0	0.0
University of Edinburgh	43	9.3	1	0.0
University of Glasgow	26	3.9	1	100.0
University of St. Andrews	31	22.6	0	0.0
SPAIN				
Universidad Central de España, Madrid	4	25.0	0	0.0
Universidad de Santiago	1	0.0	0	0.0
SWEDEN				
Karolinska Mediko-Kirurgiska Institutet, Stockholm	1	100.0	2	50.0
SWITZERLAND				
Universität Basel	164	34.8	18	44.4
Universität Bern	249	36.9	39	71.8
Universität Zürich	122	36.1	20	40.0
Université de Genève	100	37.0	12	75.0
Université de Lausanne	126	43.7	43	48.8
TURKEY				
University of Istanbul	3	100.0	0	0.0
UNION OF SOCIALIST SOVIET REPUBLICS				
First Leningrad Medical Institute	1	100.0	0	0.0
First Moscow Medical Institute	2	0.0	1	100.0
Kharkov Medical Institute	1	0.0	0	0.0
Kiev Medical Institute	5	80.0	0	0.0
Military Medical Academy, Leningrad	1	100.0	0	0.0
Second Leningrad Medical Institute	4	50.0	2	100.0
Second Moscow Medical Institute	1	0.0	0	0.0
Tomsk Medical Institute	0	0.0	1	0.0
Vinnitsa Medical Institute	1	100.0	1	100.0
Voronezh Medical Institute	1	100.0	2	50.0
Totals	6,451	45.2	1,708	59.6

these states Connecticut had the highest percentage of failures, 68.3. Seven states examined 1 each, 6 of whom were successful.

Chart 3, page 168, shows in graphic form the number registered during 1941 by states examining graduates of foreign faculties of medicine. Included in the chart are 52 granted licenses without examination, with but 3 exceptions, on the basis of a license obtained in the United States. The states which licensed more than 5 graduates are indicated by states reproduced in black; those shaded, 5 or less.

TABLE 31.—*Physicians Examined on the Basis of Credentials Obtained in Countries Other Than the United States and Canada, 1930-1941*

Year	Number Examined	Passed	Percentage Failed
1930	167	92	44.9
1931	158	91	42.4
1932	182	96	47.3
1933	200	129	35.5
1934	285	170	40.2
1935	437	303	30.7
1936	588	382	35.0
1937	*920	637	30.8
1938	1,164	716	38.5
1939	1,691	839	50.4
1940	2,088	948	54.7
1941	1,708	690	59.6
Totals	9,588	5,093	46.9

In table 30 are assembled figures showing for the five year period 1936-1940 the number of graduates of faculties of medicine outside the United States and Canada admitted to licensing examinations in this country. Included also is a tabulation for 1941. There were represented one hundred and nineteen European faculties and nine of the licensing corporations of Great Britain, and sixteen schools of other countries.

During the five year period 1936-1940, 6,451 were examined, with 45.2 per cent failures and, in 1941, 1,708 with 59.6 per cent failures.

The largest group from any one school examined in the five year period were 1,318 from the University of Vienna, of whom 45.7 per cent failed. There were 650 from the University of Berlin, with 44.9 per cent failures. Large numbers also were examined who presented credentials from the universities of Prague, Paris, Freiburg, Frankfort-on-the-Main, Würzburg, Munich, Breslau, Heidelberg, Bologna, Naples, Rome, Basel, Bern, Zurich, Geneva and Lausanne. There were 284 in the five year period who presented in lieu of the M.D. degree the triple qualification certificate of Scotland. These individuals secured their education in the so-called extramural schools of Scotland.

TABLE 32.—*Annual Registration Required*

Alaska	Nebraska
Arizona	Nevada
California	New York
Colorado	North Dakota
Connecticut	Oklahoma
Florida	Oregon
Hawaii	Pennsylvania
Idaho	Texas
Iowa	Utah
Kansas	Washington
Louisiana	Wyoming
Minnesota	

Table 31 records the number of graduates of faculties of medicine abroad examined for medical licensure in the United States in twelve years, 1930 to 1941 inclusive. Altogether 9,588 were examined, of whom 5,093 passed and 46.9 per cent failed. The greatest number, 2,088, were examined in 1940, when 54.7 per cent failed. The number licensed in twelve years increased from 92 in 1930 to the high peak of 948 in 1940. In 1941, 158 fewer were registered than in 1940. The highest percentage of failures occurred in 1941, 59.6. At no time during this twelve year period did fewer than 30.7 per cent fail.

The Council on Medical Education and Hospitals does not grade or classify medical schools outside the United States and Canada. No opportunity is afforded for visiting and inspecting such schools, nor are official reports received from them. The Council therefore has no evidence on which to base a rating. A list of foreign schools which has been published from time to time merely serves as a key to the American Medical Directory and indicates the names of the institutions which physicians now licensed to practice in the United States attended or from which they graduated. In the next edition, because of the inability to verify claims of foreign degrees, it is planned to indicate by the symbol ° that the information given is the licensing board's record of the credential submitted to and accepted as meeting the educational qualifications for licensure. It may be assumed that for those without this symbol there has been official verification received.

ANNUAL REGISTRATION

Twenty-one states, Alaska and Hawaii, as shown in table 32, require that all physicians register annually. Some of these states require such registration whether or not physicians reside in the state. The fee for registration is generally $2.

APPROVED EXAMINING BOARDS IN MEDICAL SPECIALTIES

The House of Delegates of the American Medical Association in 1933 authorized the Council on Medical Education and Hospitals to formulate standards and approve examining boards in the medical specialties. The resolution urged that the machinery of the American Medical Association, including the publication of the American Medical Directory, be used in furthering the work of boards accredited under this plan.

Standards governing approval of specialty boards were compiled by the Council and approved by the House of Delegates in 1934. In addition to regulations relating to the organization and operation of specialty boards, the Essentials of Approved Examining Boards in Specialties contains also the minimum qualifications deemed necessary for certification as a specialist. The latter include graduation from an approved medical school, an internship in a hospital approved by the Council and a period of specialized training in a selected field.

Examining and certifying boards had already been established in ophthalmology (1917), otolaryngology (1924), obstetrics and gynecology (1930) and dermatology and syphilology (1932), but the resolution was introduced in 1933 in the belief that there was need for a universal standard governing all fields of medical practice in order that properly qualified physicians might readily be recognized.

Eleven boards have been organized since 1933. These boards, together with the four previously operating, are now fully approved by the Council and represent the specialties of anesthesiology, dermatology and syphilology, internal medicine, neurologic surgery, obstetrics and gynecology, ophthalmology, orthopedic surgery, otolaryngology, pathology, pediatrics, plastic surgery, psychiatry and neurology, radiology, surgery and urology.

The American Board of Internal Medicine by special examination certifies specialists in allergy, cardiovascular disease, gastroenterology and tuberculosis. Similarly the American Board of Surgery certifies specialists in proctology.

Approved Examining Boards in Medical Specialties

Key No. A. B.	Name of Board	Year of Incorporation	Certificates Awarded: Total Issued to March 1, 1941	Certificates Awarded: Total Issued to March 1, 1942
1.	American Board of Pediatrics	1933	1,641	1,784
2.	American Board of Psychiatry and Neurology	1934	1,062	1,151
3.	American Board of Orthopaedic Surgery	1934	704	757
4.	American Board of Dermatology and Syphilology	1932	553	607
5.	American Board of Radiology	1934	1,523	1,699
6.	American Board of Urology	1935	782	849
7.	American Board of Obstetrics and Gynecology	1930	1,242	1,469
8.	American Board of Internal Medicine	1936	2,449	2,556
9.	American Board of Pathology	1936	759	830
10.	American Board of Ophthalmology	1917	1,829	1,979
11.	American Board of Otolaryngology	1924	3,181	3,349
12.	American Board of Surgery	1937	1,674	1,916
13.	American Board of Anesthesiology	1938	105	146
14.	American Board of Plastic Surgery	1937	111	126
15.	American Board of Neurological Surgery	1940	67	107
	Totals		17,682	19,425

Certification in the subspecialties: By the American Board of Internal Medicine: Allergy 59; cardiovascular disease 221; gastroenterology 99; tuberculosis 105; total 484. By American Board of Surgery: Proctology 46. Total certified in the subspecialties 530.

A key number has been assigned to each approved specialty board, such as A.B.1, and the biographic records of physicians published in the American Medical Directory include by this means reference to those certified by these boards.

The identifying numerical symbols of the boards, the number of certificates awarded prior to March 1, 1941 and those certified from that date to March 1, 1942 respectively appear in the accompanying tabulation. On March 1, 1941 there were 17,682 physicians certified by these fifteen approved boards and in the following year 1,756, excluding the subspecialties, a total of 19,425 as of March 1, 1942. In the subspecialties 484 have been registered, namely allergy 59, cardiovascular disease 221, gastroenterology 99, proctology 46 and tuberculosis 105. In internal medicine 2,556 have been certified and in surgery 1,912. The greatest number certified by any one board were the 3,349 physicians certified in otolaryngology since the organization of this board in 1924. While the board in pediatrics has been operating only since 1933, to date 1,784 have been certified as specialists. Radiology, organized in 1934, has recognized 1,699 as specialists. The oldest board in existence, ophthalmology (1917), has certified 1,979.

The future training of young men to meet the requirements of the specialty boards will be greatly curtailed, since no provision has been made for military deferment beyond the internship. The Advisory Board for Medical Specialties and the Council on Medical Education and Hospitals of the American Medical Association have appointed a committee to formulate plans to submit to the military authorities whereby a percentage of interns may be given an opportunity to continue their training in the special fields of medicine.

For the current emergency the specialty boards in anesthesiology, dermatology and syphilology, internal medicine, orthopedic surgery, pediatrics, psychiatry and neurology and radiology will permit one year of military service to be applied toward the satisfaction of one year of graduate training. Urology does not give routine credit for military service but may grant a credit of one year toward the requirement of two years of private practice. An applicant entering military service and assigned to work in general surgery may receive credit toward the required special training up to a maximum of six months by the American Board of Obstetrics and Gynecology. The surgical board will accept service in a military hospital in lieu of an equal amount of time spent in a civil hospital as a resident. Boards in ophthalmology, otolaryngology and pathology will consider each case individually on its own merits. Allowance for military service is under consideration by the boards in neurologic and plastic surgery.

BASIC SCIENCE BOARDS

Basic science requirements underlying the practice of the healing art have been created by legislative action in sixteen states and the District of Columbia. These acts provide certification by a board of examiners in the basic sciences as a prerequisite to eligibility for a license to practice any branch of the healing art, whether the license is to be issued after written examination or on the basis of endorsement of credentials or reciprocity. Connecticut and Wisconsin, in 1925, were the first states to enact laws. The most recent addition to the list, and the only new one added in 1941, was New Mexico. While the basic science laws in some states include reciprocal agreements, the certificate is obtainable only after examination in the majority of instances.

In 1941 basic science boards were in operation in Arizona, Arkansas, Colorado, Connecticut, the District of Columbia, Florida, Iowa, Michigan, Minnesota, Nebraska, New Mexico, Oklahoma, Oregon, Rhode Island, South Dakota, Washington and Wisconsin. The years in which the various laws were enacted are shown in table 1.

TABLE 1.—*States Having Basic Science Laws and Year of Enactment*

Arizona	1936	Nebraska	1927
Arkansas	1929	New Mexico	1941
Colorado	1937	Oklahoma	1937
Connecticut	1925	Oregon	1933
District of Columbia	1929	Rhode Island	1940
Florida	1939	South Dakota	1939
Iowa	1935	Washington	1927
Michigan	1937	Wisconsin	1925
Minnesota	1927		

TABLE 2.—*Subjects*

	Examinations Required in: Anatomy	Bacteriology	Chemistry	Diagnosis	Hygiene	Pathology	Physiology	Public Health
Arizona	+	+	+	..	+	+	+	..
Arkansas	+	+	+	..	..	+	+	..
Colorado	+	+	+	..	..	+	+	..
Connecticut	+	..	..	+	+	+	+	..
Dist. Columbia	+	+	+	..	..	+	+	..
Florida	+	+	+	..	..	+	+	..
Iowa	+	+	+	..	+	+	+	..
Michigan	+	+	+	..	+	+	+	+
Minnesota	+	+	+	..	+	+	+	..
Nebraska	+	+	+	..	+	+	+	..
New Mexico	+	+	+	..	..	+	+	..
Oklahoma	+	+	+	..	..	+	+	..
Oregon	+	..	+	..	+	+	+	..
Rhode Island	+	+	+	..	..	+	+	..
South Dakota	+	+	+	..	..	+	+	..
Washington	+	..	+	..	+	+	+	..
Wisconsin	+	..	..	+	..	+	+	..

Shown in table 2 are the subjects in which examinations are conducted by the respective states and the District of Columbia. The subjects included in basic science examinations are specified by the statutes. The

examining boards may neither add to nor subtract from such subjects. All boards examine in anatomy, pathology and physiology, fifteen examine in chemistry, thirteen in bacteriology, eight in hygiene, two in diagnosis and one in public health.

Applicants examined during 1941 are presented in four groups in table 3; namely, physicians or medical students, osteopaths, chiropractors and unclassified applicants. Included among those unclassified were 17 doctors of dentistry examined in Rhode Island and 3 naturopaths, 2 examined in Connecticut and 1 in Iowa. For the remainder it was not possible to determine what profession they represented. In applying for a basic science certificate it is not necessary in most of the states to mention the school of practice, but by checking the biographic records of the American Medical Association and various directories it has been possible to determine the profession of the majority of candidates.

TABLE 3.—*Applicants Examined, 1941*

	Physicians or Medical Students		Osteopaths		Chiropractors		Unclassified		Total Examined	Passed	Failed	Percentage Failed
	P	F	P	F	P	F	P	F				
Arizona	40	..	1	..	0	..	1	..	66	42	24*	36.4
Arkansas	97	2	0	0	0	0	0	0	99	97	2	2.0
Colorado	72	19	5	7	0	0	8	3	114	85	29	25.4
Connecticut	133	2	2	1	1	4	0	2	145	136	9	6.2
Dist. of Columbia	21	0	0	0	0	0	0	0	21	21	0	0.0
Florida	196	25	12	3	0	3	0	0	239	208	31	13.0
Iowa	103	22	44	25	0	0	43	58	295	190	105	35.6
Michigan	131	17	1	2	0	0	2	7	160	134	26	16.2
Minnesota	208	40	1	3	1	0	4	7	264	214	50	18.9
Nebraska	100	11	2	3	0	0	2	0	118	104	14	11.9
New Mexico	9	1	0	0	0	0	0	0	10	9	1	10.0
Oklahoma	50	1	0	0	1	0	3	0	55	54	1	1.8
Oregon	77	23	1	0	0	0	4	7	112	82	30	26.8
Rhode Island	43	6	2	0	0	0	9	5	65	54	11	16.9
South Dakota	8	1	0	0	0	0	1	1	11	9	2	18.2
Washington	134	36	4	9	1	4	0	1	189	139	50	26.5
Wisconsin	138	2	21	2	1	0	13	8	185	173	12	6.5
Totals—Examined	1,768		151		16		189			2,148		
Totals—Passed	1,560		96		5		90			1,751		
Totals—Failed	208		55		11		99			397		
Percentage Failed	11.8		36.4		68.8		52.4			18.5		

* School of practice undeterminable since names of failures not supplied.

There were 2,148 candidates in the various groups examined last year by the seventeen boards named. Of this number 1,768 were doctors of medicine or medical students, 151 osteopaths, 16 chiropractors, and 189 were placed in the unclassified group. Of all applicants examined, 1,751 passed and 397, 18.5 per cent, failed. Of the physicians examined 11.8 per cent failed; osteopaths 36.4 per cent, chiropractors 68.8 per cent and unclassified 52.4 per cent. Among those who passed there were 1,560 physicians, 96 osteopaths, 5 chiropractors and 90 who were unclassified. Ten doctors of dentistry passed but none of the naturopaths. Iowa examined the greatest number, 295, of whom 35.6 per cent failed. The next largest number, 264, were examined in Minnesota, with 18.9 per cent failures. One other state examined more than 200, Florida, of whom 13.0 per cent failed.

Osteopaths were examined in Arizona, Colorado, Connecticut, Florida, Iowa, Michigan, Minnesota, Nebraska, Oregon, Rhode Island, Washington and Wisconsin—twelve states. Chiropractors appeared for examination in only six states—Connecticut, Florida, Minnesota, Oklahoma, Washington and Wisconsin.

The highest percentage of failures, 36.4, was in Arizona, which examined 66 individuals. It is the policy of the Arizona Board of Examiners in the Basic Sciences to omit the names of applicants who fail examinations, and the law does not require the board to record the professional school of graduation of the examinees. The failures for this state therefore are recorded in the total column only.

TABLE 4.—*Certificates Issued by Examination, Reciprocity and Endorsement, 1941*

	Examination					Reciprocity and Endorsement					
	Physicians or Medical Stud.	Osteopaths	Chiropractors	Unclassified	Totals	Physicians or Medical Stud.	Osteopaths	Chiropractors	Unclassified	Totals	Registered
Arizona	40	1	0	1	42	0	0	0	0	0	42
Arkansas	97	0	0	0	97	29	13	1	0	43	140
Colorado	72	5	0	8	85	9	4	0	1	14	99
Connecticut	133	2	1	0	136	0	0	0	0	0	136
Dist. of Columbia	21	0	0	0	21	39	0	0	0	39	60
Florida	196	12	0	0	208	0	0	0	0	0	208
Iowa	103	44	0	43	190	61	4	0	2	67	257
Michigan	131	1	0	2	134	1	1	0	4	6	140
Minnesota	208	1	1	4	214	70	6	0	14	90	304
Nebraska	100	2	0	2	104	3	0	0	1	4	108
New Mexico	9	0	0	0	9	0	0	0	0	0	9
Oklahoma	50	0	1	3	54	1	0	0	0	1	55
Oregon	77	1	0	4	82	10	4	0	3	17	99
Rhode Island	43	2	0	9	54	0	0	0	0	0	54
South Dakota	8	0	0	1	9	6	6	0	0	12	21
Washington	134	4	1	0	139	0	0	0	0	0	139
Wisconsin	138	21	1	13	173	50	6	1	2	59	232
Totals	1,560	96	5	90	1,751	279	44	2	27	352	2,103

Four other states had more than 25 per cent of their candidates fail, while the District of Columbia reported no failures.

The number of certificates (2,103) issued by examination, reciprocity and endorsement are recorded in table 4. A total of 1,751 were granted after examination; 1,560 were issued to physicians or medical students, 96 to osteopaths, 5 to chiropractors and to 90 persons who were unclassified. There were also 352 certified without examination, by reciprocity and endorsement, representing 279 physicians, 44 osteopaths, 2 chiropractors and 27 in the unclassified group.

TABLE 5.—*Total Candidates, 1927-1941*

	Physicians or Medical Students Examinations						Other Practitioners Examinations					
	Number of Boards	Examined	Passed	Failed	Percentage Failed	Endorsement	Total Certified	Examined	Passed	Failed	Percentage Failed	Endorsement	Total Certified
1927	5	305	279	26	8.5	26	305	22	15	7	31.8	1	16
1928	5	646	586	60	9.3	19	605	59	31	28	47.5	0	31
1929	7	668	610	58	8.7	75	685	66	31	35	530	0	31
1930	7	685	606	79	11.5	118	724	78	30	48	61.5	4	34
1931	7	680	586	94	13.8	141	727	107	48	59	55.1	0	48
1932	7	657	590	67	10.2	106	696	78	44	34	43.6	12	56
1933	8	601	527	74	12.3	121	648	60	30	30	50.0	10	40
1934	9	815	725	90	11.0	127	852	51	26	25	49.0	11	37
1935	10	882	761	121	13.7	110	871	74	33	41	55.4	4	37
1936	10	1,032	891	141	13.7	230	1,121	66	26	40	60.6	13	39
1937	12	1,231	1,061	170	13.8	192	1,253	113	41	72	63.7	10	51
1938	12	1,168	1,026	142	12.2	267	1,293	158	70	88	55.7	26	96
1939	14	1,141	1,013	128	11.2	727	1,740	218	97	121	55.5	204	391
1940	16	1,303	1,140	163	12.5	324	1,464	280	153	127	43.9	22	175
1941	17	1,768	1,560	208	11.8	279	1,839	356	191	165	46.3	73	264
Totals		13,582	11,961	1,621	11.9	2,862	14,823	1,786	866	920	51.5	480	1,346

Minnesota certified 90 without examination, the greatest number, of whom 70 were physicians, 6 osteopaths and 14 unclassified. Arizona, Florida and Washington have no reciprocal relations. None were certified by this method in Connecticut, New Mexico or Rhode Island. Osteopaths were registered in all states but Arizona, Connecticut, the District of Columbia, Ne-

braska, New Mexico, Oklahoma, Rhode Island and Washington, while chiropractors were registered by this method in but two states—Arkansas and Wisconsin.

Altogether, 2,103 individuals received basic science certificates in 1941 in seventeen states, ranging from 9 in New Mexico to 304 in Minnesota.

Table 5 shows the number of candidates examined and certified by basic science boards in fifteen years, 1927 to 1941 inclusive. In 1928, when five boards were functioning, there were 646 physicians examined, of whom 9.3 per cent failed, and 59 other practitioners, of whom 47.5 per cent failed. In 1941, by comparison, 1,768 were examined, of whom 11.8 per cent failed and 356 other practitioners, 46.3 per cent of whom failed. During the fifteen year period a total of 13,582 physicians or medical students were examined, of whom 11,961 passed and 1,621, 11.9 per cent, failed, while in the same period 1,786 other practitioners were examined, of whom 866 passed and 920, 51.5 per cent, failed. During this period also 2,862 physicians and 480 other practitioners were certified without examination.

Altogether 16,169 certificates have been issued by basic science boards since 1927, of which 14,823 were granted to physicians or medical students and 1,346 to other practitioners. In this period also 13,582 physicians or medical students were examined, of whom 11,961 were registered, and 1,786 other practitioners, of whom only 866 were registered. Since 1927, 2,862 physicians and 480 others received certificates by reciprocity and endorsement.

From the high percentage of failures in the other practitioners group it seems apparent that the enforcement of basic science laws affects mostly this group. The object of basic science legislation is to provide a means of insuring that all candidates seeking the right to care for sick and injured people shall first possess a reasonable knowledge of the sciences fundamental to the healing art.

NATIONAL BOARD OF MEDICAL EXAMINERS

The National Board of Medical Examiners was founded in 1915 by Dr. W. L. Rodman, then President of the American Medical Association, and chartered on March 17, 1922 under the laws of the District of Columbia. Its purpose was to establish in this country a qualifying examination of such high character that successful candidates could be safely admitted to the practice of medicine without further examination. Its membership at present numbers twenty-nine, representing the three federal services, the Federation of State Medical Boards of the United States, the Association of American Medical Colleges, the Council on Medical Education and Hospitals of the American Medical Association and fourteen members elected at large.

The fulfilment of the ideals of its founder is evidenced by the fact that the certificate of the National Board is accepted as an adequate qualification for a medical license by the licensing authorities of the District of Columbia and all states except Florida, Louisiana, Texas and Wisconsin. It is also accepted by the territories of Alaska, Hawaii, Puerto Rico and the Canal Zone. The states, territories and possessions which will endorse certificates of the National Board of Medical Examiners are recorded in table 1.

The only additional examinations required of those who hold the certificate of the National Board by the states mentioned are oral examinations in Connecticut, Illinois, Maine, Montana, Rhode Island and Wyoming, and a supplemental written examination in Michigan. California requires that the certificate of the National Board must be dated not less than one year prior to applying for a medical license. Pennsylvania requires a rotating internship.

TABLE 1.—*States Endorsing Certificates of National Board of Medical Examiners*

Alabama	Illinois	Nebraska	Puerto Rico
Alaska	Indiana	Nevada	Rhode Island
Arizona	Iowa	New Hampshire	South Carolina
Arkansas	Kansas	New Jersey	South Dakota
California	Kentucky	New Mexico	Tennessee
Canal Zone	Maine	New York	Utah
Colorado	Maryland	North Carolina	Vermont
Connecticut	Massachusetts	North Dakota	Virginia
Delaware	Michigan	Ohio	Washington
Dist. of Columbia	Minnesota	Oklahoma	West Virginia
Georgia	Mississippi	Oregon	Wyoming
Hawaii	Missouri	Pennsylvania	
Idaho	Montana		

The examinations of the National Board in the basic sciences are accepted in lieu of the examinations in these subjects given by the basic science boards of Connecticut, Iowa, Minnesota, Nebraska and the District of Columbia. Diplomates are admitted to the final examination of the Conjoint Examining Boards of England and Ireland and the Triple Qualification Board of Scotland. The certificate is accepted by the United States Public Health Service in lieu of the usual written examination. Diplomates are admitted to the Mayo Foundation without further examination. Finally, the certificate is recognized as a credential of merit by hospital boards and by various medical organizations, including faculties of medical schools and examining boards in the medical specialties.

In the following paragraphs data are presented for the twenty-fourth consecutive year regarding the examinations conducted and the issuance of certificates by the National Board of Medical Examiners. These statistics are based on official reports received periodically from the executive office of the National Board.

The early development of the work of the National Board was materially affected by the participation of the United States in the World War, but since 1922 the number obtaining the certificate has been steadily increasing.

TABLE 2.—*Examinations, 1916-1921*

Date		Total Examined	Failed	Percentage Failed
October	1916	10	5	50.0
June	1917	12	3	33.3
October	1917	28	6	21.5
January	1918	20	2	10.0
April	1918	23	5	26.1
December	1918	16	1	6.3
June	1919	52	1	1.9
February	1920	48	12	25.0
May	1920	60	14	23.3
February	1921	16	5	31.3
June	1921	40	3	7.5
Totals		325	57	14.3

From October 1916 to Dec. 31, 1921 eleven examinations were held and 268 candidates were certified. The results of each examination during this period are given in table 2.

Since 1922 the examination has been given in three parts in the following sequence: part I, a written examination, in each of the six fundamental medical sciences; part II, likewise a written examination, in five major

clinical subjects, and part III, the clinical preparation of the candidate after one year's internship. Examinations in parts I and II are held in February, June and September at approved medical schools provided there are at least 5 candidates available, and part III examinations are held at times sufficiently frequent to accommodate all eligible candidates in twenty-two established centers throughout the United States.

The tables hereinafter presented enumerate the results of examinations in parts I, II and III for each calendar year since 1922, including those who passed and failed examinations, and those certified.

Candidates are required to take all six subjects of part I at a regular examination period unless entitled to take an incomplete examination or electing to take a divided examination. An incomplete examination is allowed candidates taking part I at the end of their second year in schools whose third year curriculums include courses in one or two subjects of this part. The examinations in the subjects not yet completed are therefore postponed and may be taken at any examination period after the candidate has completed them in his medical school. Any candidate not entitled to take an incomplete examination in part I may, if he so elects, take a divided examination by writing any four subjects at one time and the remaining two within thirteen months, but after at least one semester of study. Incomplete examinations have been enumerated in subsequent tabulations but were not included in percentage computations. Those electing to take a divided examination are excluded from the statistical presentations until reported as having passed or failed the complete examination.

A candidate who fails to make an average of at least 75 per cent in three or more main divisions of part III is required to repeat those divisions. In such case the candidate is "referred" and required after a three months interval to pass a reexamination. Referred candidates are likewise excluded from the statistics.

Three examinations in part I were held in 1941, and four in part II. The results of these examinations, together with totals for twenty years, are included in tables 3 and 4. The figures cover the totals of each examination given during a calendar year and include some who fail and are reexamined during the same year and also some who pass parts I and II in the same year. They represent therefore examinations conducted rather than individuals examined.

Altogether, 1,640 examinations were given in part I in 1941, of whom 1,087 candidates passed and 207, 12.6 per cent failed. In 1941 also 346 incomplete examinations were given in part I. In 1941, 1,001 examinations were held in part II. There were 954 successful examinations and 46, or 4.6 per cent, failures. One candidate was reported as having taken an incomplete examination.

Since 1922 a total of 22,400 examinations have been given in part I and 12,085 in part II. During this period, 14,219 passed part I and 11,050 part II. In twenty years there have been 2,421 failures in part I, 10.8 per cent, and 989 failures in part II, 8.2 per cent.

From 1922 to 1941 inclusive, 5,760 took incomplete examinations in part I and 46 in part II.

The results of examinations in part III for the twenty year period 1922 to 1941 inclusive are given in table 5. In 1941, 910 were examined, as compared with only 22 in 1922. This was the greatest number examined in any one year. Of those examined in 1941, 25, or 2.7 per cent, failed. In twenty years 9,215 were examined, of whom 8,824 were granted certificates and 391,

TABLE 3.—*Examinations in Part I in 1941 and 1922-1941*

Date	Total Examinations	Passed	Incomplete	Failed	Percentage Failed
February	218	167	26	25	11.5
June	1,019	688	194	137	13.4
September	403	232	126	45	11.2
Totals	1,640	1,087	346	207	12.6
1922	388	263	58	67	20.3
1923	507	349	77	81	18.8
1924	591	415	69	107	20.5
1925	608	400	50	158	28.3
1926	625	436	104	85	16.3
1927	702	452	159	91	16.8
1928	843	533	231	79	12.9
1929	1,096	675	331	90	11.8
1930	1,260	801	345	114	12.5
1931	1,277	755	425	97	11.4
1932	1,307	847	371	89	9.5
1933	1,234	782	316	136	14.8
1934	1,241	809	347	85	9.5
1935	1,264	785	410	69	8.1
1936	1,344	858	363	123	12.5
1937	1,435	871	415	149	14.6
1938	1,654	986	508	160	14.1
1939	1,733	1,048	460	225	17.7
1940	1,651	1,067	375	209	16.4
1941	1,640	1,087	346	207	12.6
Totals	22,400	14,219	5,760	2,421	10.8

TABLE 4.—*Examinations in Part II in 1941 and 1922-1941*

Date	Total Examinations	Passed	Incomplete	Failed	Percentage Failed
February	116	107	1	8	6.9
May	632	615	0	17	2.7
June	179	159	0	20	11.2
September	74	73	0	1	1.4
Totals	1,001	954	1	46	4.6
1922	109	90	0	19	17.4
1923	192	170	2	20	10.5
1924	267	227	0	40	15.0
1925	342	309	0	33	9.6
1926	381	334	1	46	12.1
1927	361	314	1	46	12.8
1928	410	371	1	38	9.3
1929	465	399	19	47	10.5
1930	629	543	7	79	11.4
1931	719	630	2	87	12.1
1932	732	674	0	58	7.9
1933	714	651	0	63	8.8
1934	633	583	0	50	7.9
1935	689	620	0	69	10.0
1936	768	716	2	50	6.5
1937	855	803	1	51	6.0
1938	861	815	0	46	5.3
1939	938	884	0	54	5.8
1940	1,028	963	9	56	5.5
1941	1,001	954	1	46	4.6
Totals	12,085	11,050	46	989	8.2

TABLE 5.—*Examinations in Part III, 1922-1941*

	Total Examinations	Passed	Failed	Percentage Failed
1922	22	22	0	0.0
1923	82	81	1	1.2
1924	126	120	6	4.8
1925	219	206	13	5.9
1926	255	243	12	4.7
1927	293	272	21	7.2
1928	322	306	16	5.0
1929	352	337	15	4.3
1930	420	401	19	4.5
1931	437	419	18	4.1
1932	550	522	28	5.1
1933	551	526	25	4.5
1934	567	548	19	3.4
1935	598	578	20	3.3
1936	576	547	29	5.0
1937	668	630	38	5.7
1938	706	682	24	3.4
1939	770	729	41	5.3
1940	791	770	21	2.7
1941	910	885	25	2.7
Totals	9,215	8,824	391	4.2

Between 1916 and 1921 a total of 325 were examined, of whom 268 passed and 57, 14.3 per cent failed. Total certificates awarded up to and including 1941, 9,092.

4.2 per cent, failed. Between 1916 and 1921, certificates were awarded to 268 candidates. Altogether from 1916 up to and including 1941, 9,092 certificates have been awarded. Physicians who earn the certificate are designated Diplomates of the National Board and are privileged to use the designating initials D.N.B.

The number of individuals examined during any one year is given in table 6. The classification as passed or failed, in cases in which more than one examination has been taken in a given year, was based on the results of the last examination during the year in question. For example, if in 1941 a candidate passed part I but later in 1941 failed part II, he is listed as having failed. Figures computed on this basis indicate there were 3,318 who took at least one of the examinations of the National Board of Medical Examiners during 1941, as compared with 525 in 1922. A total of 40,486 individuals were examined in one or more of the examinations in the twenty years shown, of whom 31,638 passed, 5,520 took incomplete examinations and 3,328, 8.2 per cent, failed.

Physicians certified as diplomates in 1941 numbered 885, representing graduates of fifty-five medical schools

TABLE 6.—*Parts I, II and III, Excluding Duplications, 1922-1941*

	Total Examined	Passed	Incomplete	Failed	Percentage Failed
1922	525	381	58	86	18.4
1923	775	594	79	102	14.7
1924	978	756	69	153	16.8
1925	1,167	915	50	202	18.1
1926	1,161	930	105	126	11.9
1927	1,248	947	142	159	14.4
1928	1,430	1,101	211	118	9.7
1929	1,723	1,280	319	124	8.8
1930	2,044	1,547	322	175	10.2
1931	2,218	1,632	410	176	9.7
1932	2,342	1,850	355	137	6.9
1933	2,277	1,806	280	191	9.6
1934	2,261	1,801	330	130	6.7
1935	2,368	1,831	408	129	6.6
1936	2,517	1,989	353	175	8.1
1937	2,735	2,151	397	187	8.0
1938	2,992	2,308	493	191	7.6
1939	3,221	2,476	443	302	10.9
1940	3,186	2,595	363	228	8.1
1941	3,318	2,749	332	237	7.1
Totals	40,486	31,638	5,520	3,328	8.2

in the United States and three in Canada and of twenty-four faculties of medicine abroad. Table 7 records the number of diplomates from each school certified last year. Six medical schools require students to take part 1 of the examination of the National Board at some time before receiving their medical degree; namely, the College of Medical Evangelists, Yale University School of Medicine, Boston University School of Medicine, the New York Medical College, Flower and Fifth Avenue Hospitals, Albany Medical College and the University of Buffalo School of Medicine. More than 34 of the graduates of each of these schools have become diplomates of the National Board in 1941. In addition, the graduates of Georgetown University Medical School, Northwestern University Medical School, Harvard Medical School, Tufts College Medical School, Albany Medical College, and Duke University School of Medicine represented the majority of those certified last year. The greatest number, 80, were graduates of Tufts College Medical School.

Diplomates licensed, on the basis of their credentials, increased from 2 in 1917 to 714 in 1941, 6,870 having been so licensed since the National Board was formed. However, 9,092 have received the certificate of the board. In 1941 diplomates were licensed on the basis of their National Board Certificate in thirty-eight states, the District of Columbia, Alaska and Hawaii. The number so registered in each state are recorded in table 8.

As the accelerated war emergency curriculums in the medical schools of the country take form, the National Board of Medical Examiners will adjust its examination schedule, which will be satisfactory to all concerned. No change in the examination schedule for the present year seems at present to be necessary.

TABLE 7.—*Diplomates from Individual Medical Schools, 1941*

	Certificates Awarded		Certificates Awarded
Univ. of Arkansas	1	Albany Med. Coll.	32
Coll. of Med. Evan.	46	Columbia Univ.	14
Stanford Univ.	3	Cornell Univ.	19
Univ. of California	1	Long Island Coll. of Med.	21
Univ. of Southern Calif.	1	N. Y. Med. Coll.	58
Univ. of Colorado	6	New York Univ.	23
Yale University	34	Syracuse Univ.	2
George Washington Univ.	10	Univ. of Buffalo	55
Georgetown Univ.	36	Univ. of Rochester	10
Howard Univ.	2	Duke Univ.	59
Emory Univ.	1	Univ. of Cincinnati	1
Univ. of Georgia	1	Western Reserve Univ.	1
Loyola Univ.	3	Univ. of Oklahoma	2
Northwestern Univ.	25	Univ. of Oregon	2
Rush Med. Coll.	5	Jefferson Med. Coll.	8
Univ. of Chicago	11	Temple Univ.	8
Univ. of Illinois	5	Univ. of Pennsylvania	14
Indiana Univ.	2	Univ. of Pittsburgh	1
State Univ. of Iowa	8	Woman's Med. Coll.	8
Louisiana State Univ.	3	Med. Coll. of So. Car.	1
Tulane Univ.	5	Univ. of Vermont	18
Johns Hopkins Univ.	8	Med. Coll. of Virginia	2
Univ. of Maryland	1	Univ. of Virginia	1
Boston Univ.	39	Marquette Univ.	8
Harvard Med. School	67	McGill University	12
Tufts Coll. Med. Sch.	80	Univ. of Toronto	1
Univ. of Michigan	7	Univ. of Western Ontario	1
Univ. of Minnesota	13	Foreign	55
St. Louis Univ.	15		
Washington Univ.	5	Total	885
Creighton Univ.	4		

At the meeting of the Executive Committee of the National Board of Medical Examiners held on Feb. 15, 1942 the following resolution was adopted:

Resolved, That, beginning February 15, the National Board of Medical Examiners will not accept applicants for admission to its examinations from graduates of any medical school in continental Europe or from graduates of the extramural schools of Scotland and Ireland.

TABLE 8.—*Licenses Granted on the Basis of National Board Certificates, 1941*

Alabama	6	New Hampshire	12
Arizona	5	New Jersey	23
Arkansas	3	New Mexico	1
California	23	New York	214
Colorado	6	North Carolina	16
Connecticut	44	North Dakota	2
District of Columbia	27	Ohio	22
Georgia	2	Oklahoma	2
Illinois	21	Oregon	4
Indiana	1	Pennsylvania	26
Iowa	2	Rhode Island	13
Kansas	2	Tennessee	10
Kentucky	7	Utah	1
Maine	15	Vermont	9
Maryland	10	Virginia	11
Massachusetts	100	Washington	12
Michigan	9	West Virginia	8
Minnesota	13	Alaska	2
Missouri	8	Hawaii	13
Montana	3		
Nebraska	3	Total	714
Nevada	3		

This action does not apply to graduates of university schools in the British Isles or to those candidates who had registered before Feb. 15, 1942.

One of the factors that caused the board to take this action was the refusal of approximately one half of the states of this country to grant licenses to physicians trained in European medical schools even though they had been certified by the National Board.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET - - - CHICAGO, ILL.

Cable Address - - - - "Medic, Chicago"

Subscription price - - - - - Eight dollars per annum in advance

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SATURDAY, MAY 9, 1942

MEDICAL LICENSURE EXAMINATIONS

The results of the state licensing examinations published in this issue of THE JOURNAL are striking evidence of the lack of uniformity of standards of licensure among the various states. Seven states reported not one failure in their 1941 licensing examinations; indeed, they had not had a failure in the past five years. Twelve additional states have reported failures of less than 1 per cent during the same period. Other states, notably New York, have each year reported a high percentage of failures.

In New York 21.8 per cent of the graduates of the New York State medical colleges who tried the New York State licensing examinations failed, while 39.4 per cent of the graduates of other approved medical colleges in the United States who tried these same examinations failed. Of the 145 graduates of New York State medical colleges who tried licensing examinations in other states, four, or 2.8 per cent, failed.

The lack of uniformity of results in some states is made more obvious by the fact that a candidate is passed if he receives an average of 75 per cent and is not below 50 per cent in any subject. Furthermore, in case of failure in not more than two subjects the applicant may be entitled to another examination in the subjects failed and is considered conditioned and is not reported as a failure.

Paradoxically, New York, which reported the highest percentage of failures among the graduates of approved medical colleges on its own examinations, issued a greater number of licenses on the basis of credentials without examination than did any other state.

In spite of this lack of uniformity, the fact is striking that the graduates of the foreign medical schools and the unapproved schools in the United States showed the highest percentage of failures, 59.6 and 46.0 respectively. Six states licensed graduates of unapproved schools during 1941. Four states granted unlimited licenses to practice medicine to graduates of osteopathic schools.

The best interests of the public and of the medical profession seem to demand serious thought right now on the establishment of uniform standards of licensure. These not only would facilitate the migration of qualified physicians from one state to another but would offer to the public greater assurance of the training and competence of practicing physicians. War conditions, involving as they do the migration of great masses of the population including physicians, emphasize the great need for such uniformity.

Is it unreasonable to hope that all states will sometime be willing to maintain standards high enough to make such uniformity possible?

ABSORPTION OF SURGICAL GUT

In this issue of THE JOURNAL appears a report of the Council on Pharmacy and Chemistry which is a synopsis of the results of a comprehensive investigation conducted over a period of five years on the absorption of catgut sutures. This study was initiated and carried on by Jenkins and his co-workers at the University of Chicago, Department of Surgery, under the auspices of the Council. The work that has thus far been done on this subject is being published in detail under the names of the investigators in the *Archives of Surgery*[1] in four consecutive instalments, the first of which appears in the May issue.

The term "catgut," as commonly applied to surgical sutures, is essentially a misnomer for the sheep intestine which is used. The name "surgical gut" adopted for the U. S. Pharmacopeia is a fundamental improvement in terminology. The classification of this material adopted for the U. S. P. XII recognizes four different types (designated A, B, C and D), whcih are approximately equivalent to the older terminology of plain, ten day chromic, twenty day chromic and forty day chromic catgut.

The investigators made a detailed experimental study of a large series of catgut suture implants in the abdominal muscles of dogs and a few clinical tests on surgical patients in order to obtain further data on the duration of tensile strength and the time required for ultimate absorption in the tissues of both the plain and the chromic types of this material. Ten standard brands of suture material, in various sizes, were examined. Specimens of the same material were also subjected to in vitro digestion tests performed in an incubated acid pepsin solution to correlate the time required for artificial digestion with the period over which the sutures

1. Jenkins, H. P., and Hrdina, L. S.: Absorption of Surgical Gut (Catgut): I. The Decline in Tensile Strength in the Tissues, Arch. Surg. **44**: 881 (May) 1942; II. Pepsin Digestion Tests for the Evaluation of the Duration of Tensile Strength of Surgical Gut in the Tissues, ibid., June 1942. Jenkins, H. P.; Hrdina, L. S.; Swisher, F. M., and Owens, F. W.: III. The Duration of Surgical Gut in the Tissues After Loss of Tensile Strength, ibid., July 1942. Jenkins, H. P.: IV. Recommendations for the Absorbability and Digestibility Specifications of Surgical Gut, ibid., August 1942.

actually retain their holding power in the tissues. The time required for complete absorption of the implanted specimens was determined from a gross study of the cleared tissues removed from the animals, killed after varying periods of exposure. The response of the tissues to the sutures was observed from a microscopic study of the corresponding sections. The investigation shows that for the most part the plain catgut examined maintained its tensile strength in the tissues for an average of approximately five days. Various sizes of the twenty day and forty day chromic material fell into three categories: that which did not maintain tensile strength for ten days, that which lasted ten to fifteen days and that which held up for fifteen to thirty days. The time observed for ultimate absorption falls into two main categories: "rapidly absorbed" (one to three weeks) for plain catgut, associated with a predominant leukocytic tissue response; "slowly absorbed" (three to six months) for chromic catgut, associated with a more conspicuous macrophage response. Some of the chromic, and even some plain, material was "intermediately absorbed." Correlation of the tissue studies with the in vitro enzyme tests indicates that the latter offer a practical method of assaying the absorption qualities of surgical gut, provided a check is made with experimental and clinical observations and care is taken to use a uniform enzyme solution.

Specifications are proposed for both the absorbability and the digestibility of each of the four types of surgical gut to be recognized in the U. S. Pharmacopeia XII, though it is indicated that division of surgical gut into four types is somewhat arbitrary, since the studies suggest only three general classes. The specifications provide for time data, in days, of the average range and the minimum and maximum ranges of duration of tensile strength and the average range in weeks or months for complete absorption in the tissues, and for digestibility values of the average range and the minimum and maximum ranges expressed as multiples of the average digestion time of type A (plain) surgical gut, to be determined from pooled catgut of this type, which has an average duration of tensile strength of approximately five days.

The primary aim of the studies now being published is to stimulate the ultimate elaboration of suitable standards and methods of testing for surgical gut. The specifications formerly used under the older designations of the material, namely "plain," "ten day," "twenty day" and "forty day," will no doubt be followed to some extent by manufacturers in labeling their products with the new terminology. Such practice will probably soon be generally superseded by more reliable testing methods of surgical gut, designed to insure accurate classification within reasonably broad standards, to enable the surgeon to evaluate better the uses of this suture material in the apposition of tissues.

Current Comment

ADDITIONS TO THE MEDICAL PROFESSION

Perhaps the most accurate index of actual additions to the medical profession of the United States is to be found in the medical licensure statistics collected by the Council on Medical Education and Hospitals of the American Medical Association and published annually in the State Board Number of THE JOURNAL. The number of graduates of the medical colleges of the United States includes a certain number of students from foreign countries and does not include students from the United States graduating from Canadian medical schools. Neither does it indicate the graduates of the foreign medical schools who initiate practice in the United States. Data presented elsewhere in this issue indicate that there were 5,681 additions to the medical profession in 1941. The number lost to the profession each year by death is approximately 3,700. There has thus occurred during 1941 a net increase of approximately 1,900 in the number of physicians in the United States. Of these 5,681 newly licensed physicians, 626 were graduates of foreign medical schools and 226 were graduates of unapproved medical colleges in the United States. During 1941, 4,738 graduates of approved medical colleges were added to the profession in the United States. Accumulated data indicate that during the past seven years there have been 41,983 new additions to the profession. As a result of increases in the number of students admitted and the adoption of an accelerated curriculum by most of the medical colleges, the annual additions to the profession from the medical schools of this country should increase by more than 25 per cent during the next few years.

PHENOL-CAMPHOR FOR "ATHLETE'S FOOT"

In THE JOURNAL, Dec. 6, 1941, a clinical note by Francis [1] on the use of a mixture of phenol and camphor for the treatment of "athlete's foot" was published. This preparation consists of 3 cc. of U. S. P. phenol and 3 Gm. of U. S. P. camphor, the entire mass being rubbed together in a mortar until it is liquefied. An alternate formula proposed in the communication was three parts of phenol and one part of camphor. Although the mixture is purported to be nonirritating to the skin, the communication warned that the phenol-camphor preparation should not be applied to the wet skin, since water has been reported to permit a release of the phenol with the result that it becomes caustic. More attention has now been drawn to this treatment by the appearance of an article in the May 1942 issue of the *Reader's Digest* entitled "A Working Cure for Athlete's Foot." The medical and pharmacy professions have received many requests for prescriptions and compoundings of the phenol-camphor mixture. Most cases of fungous infection require persistent skilful attention if the disease is to be brought under complete control. Recommendation that untrained people use on themselves an

1. Francis, Edward: Phenol-Camphor for "Athlete's Foot," J. A. M. A. **117**: 1973 (Dec. 6) 1941.

agent which has the potential danger of causticity is highly doubtful. According to information received by THE JOURNAL and the office of the Council on Pharmacy and Chemistry, a number of investigations are now being conducted to determine the extent of the causticity of the phenol-camphor mixture and its possible benefits and dangers. This has become doubly imperative because of the response of the public to the article in the *Reader's Digest*. Other factors which have been suggested as meriting consideration are the possible aggravation of an existing irritation and the absorption of phenol if the medicament is liberally applied and the affected area subsequently enclosed in bandages. Until the studies are concluded, treatment of "athlete's foot," ringworm and other fungous infections with a mixture of phenol and camphor or any other potent remedies is best intrusted to the qualified physician.

BIOTIN DEFICIENCY IN MAN

Investigations of the nutritional requirements of experimental animals influence human problems. A preliminary report just available [1] concerns biotin deficiency in man and its cure with a biotin concentrate. The deficiency was induced by feeding a diet poor in biotin; the lack of this dietary factor was accentuated by including dried egg white in the diet. The "egg white injury" syndrome in rats, now attributable to a biotin deficiency, has been studied for some years. A group of four volunteers subsisted on a diet planned to contain a minimal amount of biotin, supplemented daily with a suitable mixture of other purified vitamins. During the third and fourth weeks of the study all four subjects developed a scaly desquamation without pruritus. The condition cleared spontaneously within seven to ten days. At the seventh week one subject developed a maculosquamous dermatitis of the neck, hands, arms and legs. During the seventh and eighth weeks all showed a pronounced grayish pallor of the skin and mucous membranes which was not accounted for solely on the basis of the blood picture. The latter manifested a definite diminution in hemoglobin content, in the number of erythrocytes and in the volume of packed red cells. There was a striking rise in the serum cholesterol. Despite the daily administration of 6 mg. of thiamine hydrochloride to each subject during the entire experiment, symptoms strikingly like those noted in experimental thiamine deficiency were seen after the fifth week. Treatment with daily injections of 75 to 300 micrograms of a biotin concentrate resulted in prompt relief in each subject; 150 micrograms daily was suggested as the minimum effective amount. There was an increase in appetite on the third to fifth days after giving biotin, despite the continuance of the same experimental diet. The striking ashy pallor of the skin and mucous membranes disappeared in four days. The elevated level of serum cholesterol was significantly reduced after one week. The detailed results will be of interest in evaluating problems dealing with manifestations of spontaneous avitaminosis and its relation to biotin deficiency.

1. Sydenstricker, V. P.; Singal, S. A.; Briggs, A. P.; DeVaughn, N. M., and Isbell, H.: Science **95**: 176 (Feb. 13) 1942.

PALINDROMIC RHEUMATISM

The term "palindromic rheumatism" has been recently applied by Hench and Rosenberg [1] of the Mayo Clinic to a disorder observed by them in 34 persons; they consider the condition sufficiently distinctive to constitute a clinical entity. "Palindromic"—from the Greek—means simply "to recur." The disease described is characterized by oft recurring multiple afebrile attacks of acute arthritis and periarthritis, sometimes also para-arthritis with pain, swelling, redness and disability. The attacks appear suddenly, develop rapidly, generally last a few hours or days and then disappear completely but recur at irregularly spaced intervals. In the cases observed the two sexes were about equally affected; the ages of the patients at onset varied from 13 to 68. The majority of attacks were monoarticular; the sites of predilection were the fingers, wrist, shoulder, knee, toe and elbow. Despite the transitory presence of inflammatory exudate in articular tissues, little or no constitutional reaction was observed. Neither could they detect abnormality in laboratory tests or significant functional, pathologic or roentgenologic residues even after years of the disease and scores of attacks. From two to ten attacks occurred yearly in 9 of their cases, twenty to sixty yearly in 17 cases, one hundred to two hundred a year in 3 cases and two hundred and fifty or more a year in 5 cases. The Rochester clinicians attempt to differentiate this disorder from rheumatoid arthritis, gouty arthritis, "angioneural arthrosis" and "allergic rheumatism." Results of treatment to date have been inconclusive. The disease is a nuisance and handicap but, in spite of a total of thousands of attacks, permanent crippling was not demonstrated in any single joint. The preliminary report indicates that the claim for the establishment of "palindromic rheumatism" as a clinical entity is well supported by evidence, though it can be accepted as established only after confirmatory studies have been made by several independent observers.

COMPULSORY IMMUNIZATION

The report of a survey of all the jurisdictions under the control of the United States, summarized in *Public Health Reports*, March 6, shows that only nine states and Alaska have any express provisions requiring immunization against diphtheria. North Carolina is the only state that requires general immunization of all children between 6 and 12 months of age and those between 12 months and 5 years not previously immunized. The only children exempted are those whose parents or guardians are "bona fide members of a religious organization whose teachings are contrary to the practices required by the law." New Jersey appears to be the only state in which immunization may be required as a prerequisite to school attendance. North Dakota has a statute which "forbids making any form of vaccination or inoculation a condition precedent for admission to any public or private school or college, or for the exercise of any right."

1. Hench, P. S., and Rosenberg, E. F.: Palindromic Rheumatism: A "New," Oft Recurring Disease of Joints (Arthritis, Periarthritis, Para-Arthritis) Apparently Producing No Articular Residues, Proc. Staff Meet., Mayo Clin. **16**: 808 (Dec. 17) 1941.

MEDICINE AND THE WAR

In this section of The Journal each week will appear official notices by the Committee on Medical Preparedness of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war, and such other information and announcements as will be useful to the medical profession.

THE SALVAGE OF RUBBER AND METALS

Paul C. Cabot, deputy chief of the Bureau of Industrial Conservation of the War Production Board, Washington, D. C., has supplied the following information:

There is a critical shortage of many necessary war materials at present in this country. The primary sources of supply are now denied to us as the result of conditions in both the Pacific area and in Europe. It is becoming increasingly necessary to tap all possible secondary sources and to reclaim every ounce of these badly needed materials that we can find.

To this end there has been established, through the General Salvage Section of the Bureau of Industrial Conservation, state salvage committees in practically every state in the country. These state committees have in turn established local salvage committees in every local defense council in their territory. Complete organization, nationwide, can be expected by May 1.

There is a potentially large source of these critical materials to be reclaimed from hospitals, clinics, health departments, diagnostic laboratories—in fact, from all health and medical institutions of any kind, not excluding physicians and dentists. The Bureau of Industrial Conservation, therefore, requests that the Health and Medical Committee of the Office of Defense Health and Welfare Services make every effort to see that the need for these scarce materials is brought to their attention.

Rubber is now America's number one shortage. Our war machine must roll on rubber, and since the rupture of trade lines to the Far East we must rely in large measure on existing scrap rubber now in this country. There is also an acute shortage of metals, ferrous and nonferrous. We do not anticipate that medical institutions can make available much tonnage in scrap iron and steel, but large quantities of some of the scarcer metals may be collected from such sources.

All medical institutions and individuals desirous of helping in our "Salvage for Victory" program should get in touch directly with their state or local salvage committee, which will be able to indicate to them the best method of procedure in the collection and disposition of these materials. Following is a list of these state salvage committees.

It can be expected that the health and medical profession, which has already contributed so largely to the welfare of the nation, may by this plan be enabled to broaden the scope of its useful activities and provide a definite added service to the country in this time of need.

STATE SALVAGE COMMITTEES

Chairman	*Executive Secretary*	*Office*
	ALABAMA	
Thomas Bragg	J. Leon Gilbert	Klein-Ashley Bldg., 102 Church St., Montgomery
	ARKANSAS	426 Donaghy Bldg.,
Elmer Gosden	Wallace Cowan	Little Rock
	CALIFORNIA	State Capitol,
Judge E. P. Murphy	Harold Brayton	Sacramento
	CONNECTICUT	410 Asylum St.,
Seth L. Pierrepont	Bice Clemow	Hartford
	DELAWARE	DuPont Hotel,
J. Stuart Groves	Lieut. Col. R. G. Rust	Wilmington
	DISTRICT OF COLUMBIA	412 Albee Building,
James E. Colliflower	Horace Walker	15th & G St. N.W., Washington
	FLORIDA	313 City Admin. Bldg.,
George L. Burr Jr.	C. C. Codrington	Tallahassee
	GEORGIA	617 Bibb Building,
William T. Anderson	Thomas H. Hall III	Macon
	IDAHO	State Capitol,
John O. Orr	Lindon F. Watson	Boise
	ILLINOIS	3015 Civic Opera Bldg., 20 North
Nathaniel Leverone	Ben Regan	Wacker Drive, Chicago
	INDIANA	Board of Trade Bldg.,
Clarence A. Jackson	Dudley A. Smith	Meridian & Ohio Sts., Indianapolis
	IOWA	712 Crocker Bldg.,
Herbert Plagman	Fred J. Derrick	Des Moines
	KANSAS	(Temp.) Ottawa
Byron Gourley	Harry W. Woods	
	KENTUCKY	Old State Capitol
Judge E. C. O'Rear	G. Lee McClain	Bldg., Frankfort
	LOUISIANA	Guaranty Bank Bldg.,
Parrish Fuller	R. R. Saunders	Alexandria
	MAINE	Rm. 510, 142 High St.,
Richard N. Hallett	Clifford A. Somerville	Portland
	MARYLAND	1510 Baltimore Trust
H. Findlay French	James F. Solley Jr.	Building, Baltimore
	MASSACHUSETTS	18 Tremont Street,
Gurth F. Chambers	John I. Taylor	Boston
	MICHIGAN	1205 Detroit Savings
Kenneth M. Burns	John D. McGillis	Bank Building, Detroit
	MINNESOTA	310 Globe Building,
Raymond J. Greengard	Linus E. Vorpahl	St. Paul
	MISSISSIPPI	Deposit-Guaranty
Leland Speed	L. Russell Ellzey	Bank Bldg., Jackson
	MISSOURI	State Office Building,
Sidney R. Baer	H. A. Trowbridge	Jefferson City
	NEBRASKA	1305 State Capitol,
J. W. Seacrest	Mark Caster	Lincoln
	NEVADA	State Capitol,
Albert Caton	Bernard Hartung	Carson City
	NEW HAMPSHIRE	State House,
E. J. Soucy	(E. J. Soucy)	Concord
	NEW JERSEY	114th Regiment Armory,
Robert T. Bowman	Clinton M. White	Trenton
	NEW MEXICO	202 Water Street,
David Hughes	Capt. Fay Guthrie	Santa Fe
	NEW YORK	112 State Street,
R. Murray Willard	William Arnoldy	Albany
	NORTH CAROLINA	227 E. Edenton St.,
N. E. Edgerton	James B. Vogler	Raleigh
	OHIO	101 N. High Street
L. E. Pierson	Robert O. Weible	Columbus
	OKLAHOMA	438 Kennedy Bldg.,
E. H. Moore	Levi Ackley	Tulsa
	OREGON	314 Pioneer Trust
Claude I. Sersanous	Ralph H. Mitchell	Bldg., Salem
	PENNSYLVANNIA	302 Main Capitol
John S. Rice	Colley S. Baker	Bldg., Harrisburg
	RHODE ISLAND	Hospital Trust Bldg.,
Frederick A. Young	Lawrence Lanpher	15 Westminster St., Providence
	SOUTH CAROLINA	1230 Sumter Street,
Rex Enright	Tonquin E. Lagrons	Columbia
	TENNESSEE	State Capitol,
Leonard Sisk	Everett R. Jones	Nashville
	UTAH	Salt Lake City
Marion J. Greenwood	Boyden L. Wood	State Capitol,
	VIRGINIA	10 S. Fifth Street,
Fred W. Scott	C. H. Luebbert	Richmond
	VERMONT	49 State House,
A. Vail Allen	John O. Baxendale	Montpelier
	WASHINGTON	Old Capitol Bldg.,
J. C. Haley	Elmer J. Nelson	Olympia
	WEST VIRGINIA	56 Capitol City Bldg.,
H. E. Clovis	Burman T. Mitchell	Charleston
	WISCONSIN	7058 Plankinton Bldg.,
Robert E. Pabst	William E. Simons	161 W. Wisconsin Ave., Milwaukee
	WYOMING	State Capitol Bldg.,
Col. R. L. Esmay	Edward S. Moore Jr.	Cheyenne

CENTRAL CONTROL AND ADMINISTRATION OF EMERGENCY MEDICAL SERVICE

Medical Division Bulletin No. 4, United States Office of Civilian Defense, Washington, D. C.

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FOREWORD

This bulletin outlines the relationship of each of the various units of the Emergency Medical Service to the Control System of the Citizens' Defense Corps and the Civil Air Raid Warning System. Every movement of a protective service must be orderly and purposeful. It is therefore important that every member of the Emergency Medical Service, whether belonging to an administrative service, a field unit, an ambulance unit, a casualty receiving hospital or an emergency base hospital, understand the coordinated timing of their activities with those of other protective services under the constant direction of the Control Center.

I. AIRCRAFT WARNING SERVICE

The Aircraft Warning Service has been organized by the Combat Command of the United States Army Air Forces for detecting and reporting the presence of enemy airplanes. For the purposes of air defense, the continental United States is divided into large areas, each of which is served by an air force. An air force area is, in turn, divided into air defense regions. The command post of an air defense region is known as an information center.

Each subdivision of an air defense region is served by a central communications point known as a filter center. Filter center areas are subdivided into areas of approximately 36 square miles, in each of which is located an observation post manned by civilian observers.

The observation post reports the presence of planes to the filter center, where similar information coming in from other observation posts is assembled and evaluated by trained army officers. The combined picture of the probable height, speed, direction, type and number of enemy planes is relayed to the information center. Here the information from various filter centers is plotted on an operations map, and pursuit planes are ordered to intercept the enemy.

II. AIR RAID WARNING SYSTEM

A civil air raid warning officer at the information center notifies the communities in the path of the invading bombers to prepare for a possible air raid. This message is telephoned from the information center to the district warning centers of the civil air raid warning system and from there to the control centers of the communities in the area (fig. 1).

III. CONTROL CENTER

The control center of a community is the headquarters of the commander of the citizens' defense corps and his technical staff. Here is received all information essential for operating the civilian protection services during an emergency (fig. 2). The control center receives air raid warnings and transmits them to the proper recipients, it orders the sounding of air raid alarms, it receives reports from wardens concerning damage, and it dispatches operating units of the protection services to bombing incidents.

Large cities are subdivided into a number of districts, in each of which is a district control center. The district control center receives and transmits air raid warnings, receives reports of incidents from wardens, and controls the movement and operation of all protection units within or assigned to the district. To large incidents it sends an incident officer, who takes command of all protection forces on the scene (including the medical), orders unnecessary units back to their stations, or requests additional assistance from the control center.

Over all the district control centers of a large community or area is a main control center, which receives reports from the district control centers (not from wardens) and controls the movement of services between districts.

A. *Message Room.*—In the control center there are an electric bell and a set of four lights corresponding to the degrees of warning—yellow, blue, red and white. From the message room come the signals; the bell is rung and the appropriate light switched on as each signal is received (fig. 3).

B. *Control Room.*—In the control room is a map of the area served by the control center, on which are recorded the locations of wardens' posts, the boundaries of sectors and precincts, and the stations, depots and headquarters of the various civilian protection services. The chief of the Emergency Medical Service is responsible for the accurate recording on this map of the locations of (1) hospitals, (2) casualty stations and medical supply depots and (3) ambulances and other vehicles in transport centers. He must also know the location of emergency medical field units, the number of squads available in each unit, and which hospitals have their own ambulances.

With numbered pins of four different colors, the locations and types of incidents are indicated on the map (high explosive, incendiary, gas, unexploded bombs). Road blockages are also recorded.

C. *Control Panel.*—On a control panel are recorded the numbers and nature of the incidents, the protection services available and the services dispatched. This enables the controller to have a complete visual record of the number and disposition of his services. Pins of distinctive colors are used to identify types of service. Each pin bears a separate number indicating a service unit. Pins for the emergency medical field units are red and white and those for ambulances are white (fig. 4).

D. *Communications System.*—Telephone numbers at the control center are known only to persons authorized to call the center. Similarly, outgoing lines to stations

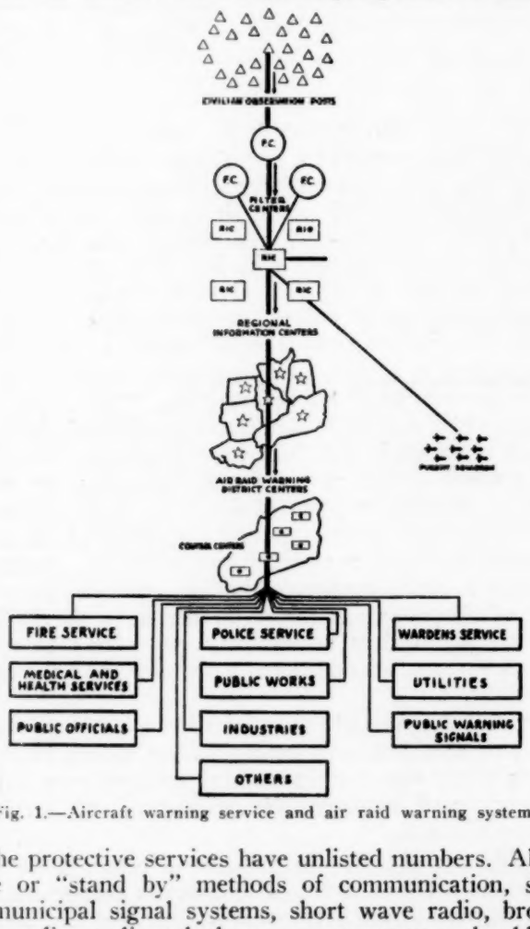


Fig. 1.—Aircraft warning service and air raid warning system.

of the protective services have unlisted numbers. Alternate or "stand by" methods of communication, such as municipal signal systems, short wave radio, broadcast radio, radio telephone or messengers should be provided for in case the telephone service is interrupted.

E. *Procedure.*—Three persons should be on duty at each control center at all times, and a full shift should be available on call.

All essential information is assembled in the control room to enable the commander and his staff to make the necessary decisions. The objectives are speed and, above all, accuracy. Written messages are used rather than verbal instructions, to reduce the possibility of error.

When the military commander decides that an air defense area is vulnerable to bombardment, he will alert the area, even though there appears to be no immediate threat of enemy action. An "alert" may be intermittent or continuous over long periods. An area which has been alerted will be blacked out at night except that essential industry and transportation will be allowed sufficient lights, and street lights will be kept on but will be properly screened so that they will not be visible from the air.

When the presence of hostile aircraft is detected in an area, a series of "warnings" flows from the informa-

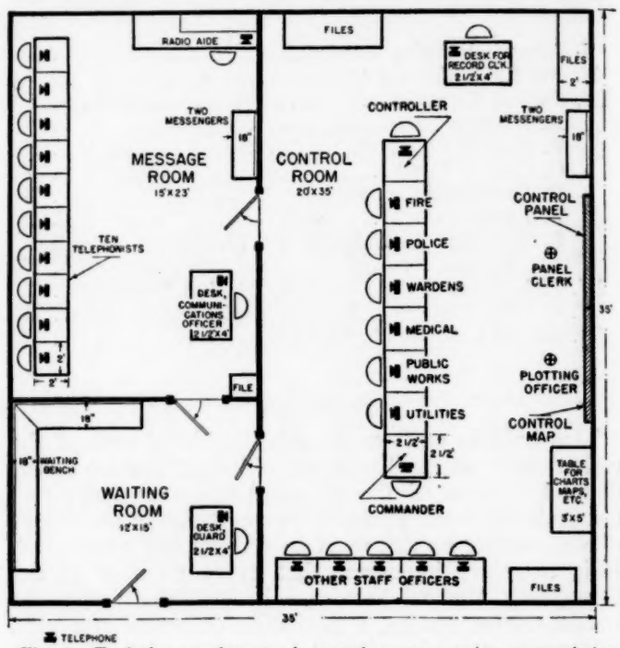


Fig. 2.—Typical room layout of control center serving a population of one hundred thousand.

tion center through the district warning centers and control centers to the final recipient. In some cases the final recipient may be warned directly from district warning centers rather than control centers.

1. Yellow Warning—*preliminary caution.*—The yellow warning is confidential and is not released to the public. It is telephoned to staff members of the control center, including the chief of Emergency Medical Ser-

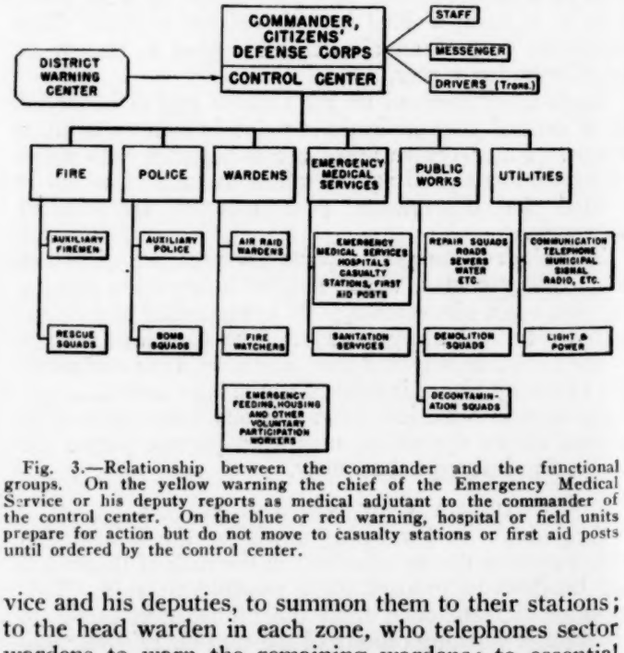


Fig. 3.—Relationship between the commander and the functional groups. On the yellow warning the chief of the Emergency Medical Service or his deputy reports as medical adjutant to the commander of the control center. On the blue or red warning, hospital or field units prepare for action but do not move to casualty stations or first aid posts until ordered by the control center.

vice and his deputies, to summon them to their stations; to the head warden in each zone, who telephones sector wardens to warn the remaining wardens; to essential industry and transport, and to police and fire stations. It is not received by medical field units.

2. Blue Warning—*lights warning.*—This means that raiders are expected to pass over the area. The warning is telephoned to industry, transportation and hospitals to notify them to obsure their lights. The blue warning is also confidential.

3. Red Warning—*action warning.*—When it appears that an air raid is imminent, the "red warning" is given to the general public. It is telephoned to all protection services, including hospitals and casualty stations, notifying them to be ready for action, and the public air raid warning is sounded for a total blackout.

4. White Message—*all clear.*—It means that the hostile planes have left the area and that industry and transportation may resume the use of lights allowed them under the provisions for the "alert."

F. *Warnings to Hospitals and Field Units of the Emergency Medical Service.*—Medical units are not as a rule brought into action on the yellow signal. This is a precautionary warning which should not disturb the operation of hospitals and the regular duties of physicians and nurses throughout the community.

The blue warning is the first received by hospitals and casualty stations. It is confidential and not a signal for calling doctors and nurses from all parts of the city to their posts at the casualty stations.

The red warning to hospitals means "Assemble your emergency field units, their equipment and transportation, but do not move until you receive orders."

In communities in which field units have not been organized in hospitals, the red warning means "Summon doctors, nurses and nurses' aides to the casualty stations and have them stand by for orders."

During a raid, after wardens have reported the location and details of incidents to the control center, fire fighters, rescue squads or other appropriate action units are dispatched to the scene. When casualties are reported, the hospital field units and ambulances are ordered to the casualty stations near the incidents.

IV. FIELD UNITS OF THE EMERGENCY MEDICAL SERVICE

The organization, equipment and operation of emergency medical field units is described in Medical Division Bulletins Nos. 1 and 2. There is great advantage in organizing nonsurgical resident staffs of hospitals—interns and nurses of the medical, pediatric and neurologic services—into emergency medical field units to serve as the first line of the casualty services. Squads of two to four interns and nurses can be on call day and night, but their regular work continues until they are notified that persons have been injured and their services are needed. Their preparedness makes it unnecessary to man all casualty stations on every alert. If, however, prolonged or repeated raiding results in continued demand for medical services at casualty stations, hospital units may be relieved by reserve units of neighborhood physicians and nurses. These units should be related to hospitals and drilled regularly in case it becomes necessary to relieve the hospital units and to staff casualty stations on a more permanent basis.

The hospital should be the center of all casualty services in its area. Its staff is ready for emergency duty at a moment's notice, and there are trained reserves

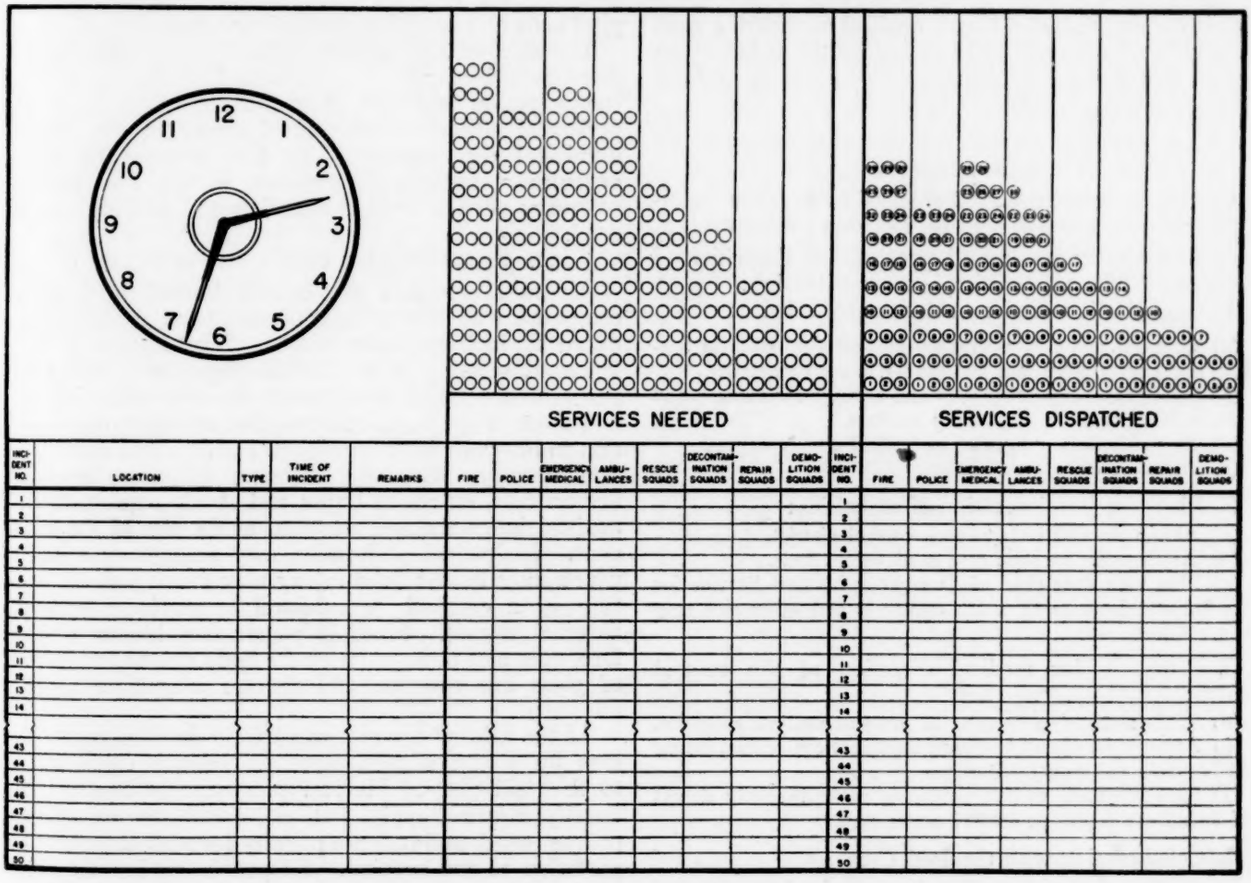


Fig. 4.—Control panel.

available in the event of prolonged or frequent attack. Failure to organize emergency medical field units within hospitals will waste time and effort. Areas alerted will be much larger than those actually attacked, and, in the absence of hospital units available at all times for immediate dispatch, practicing physicians and nurses whose services are sorely needed in their communities must man every casualty station in the alerted area.

In small hospitals which have no resident staffs, consideration should be given to a plan under which one or more physicians are on call each night. The physicians on duty would not be required to remain in the hospital, but they should be ready to take up their posts as soon as the warning is given.

All members of emergency medical field units (physicians, nurses, orderlies) and medical auxiliaries such as stretcher teams will be identified by the caduceus on the civilian defense armband, nurses' aides by the red cross on the civilian defense armband.

V. CHIEF OF EMERGENCY MEDICAL SERVICE AND DEPUTIES

Certain duties of the local chief of Emergency Medical Service are listed in Medical Division Bulletin No. 2.

A. During the period of preparation the chief of Emergency Medical Service is responsible for:

1. Organization of the field casualty service:

(*a*) Organize and drill emergency medical field units in hospitals and among physicians and nurses in the community.

(*b*) Select casualty station sites and arrange for canteen and disaster relief services at casualty stations.

(*c*) Assemble field equipment in medical supply depots.

(*d*) Assemble transport facilities.

2. Plans for hospitalization of casualties:

(*a*) Assign hospital beds to each control district.

(*b*) Arrange for periodic census of vacant beds.

(*c*) Plan with state chief of Emergency Medical Service for base hospital facilities to which casualties and other sick may be evacuated.

3. Provision for medical direction at the control center:

(*a*) Train and assign deputies to serve as medical adjutants.

(*b*) Arrange for direct telephone lines between control center and hospitals and casualty stations.

(*c*) Spot hospitals, casualty stations, medical supply depots and ambulance depots on control center map.

4. Collaboration with the Red Cross:

(*a*) Promote the training and assignment of volunteer nurses' aides.

(*b*) Extend first aid training, emphasizing priority for personnel of the Citizens' Defense Corps.

(*c*) Train stretcher teams for assignment to casualty stations.

5. Organization of casualty information and mortuary services.

B. During the period of operations the chief of Emergency Medical Service or one of his deputies serves as medical adjutant at each control center. The adjutant must be ready to report immediately on receiving the yellow warning. He must have complete knowledge of the number and availability of all service units at his disposal. He must also know the number of vacant hospital beds in the city and the maximum daily operating load each hospital can assume. On report of casualties he will order the dispatch of medical field units under the general supervision of the commander or the controller.

Large cities are usually subdivided into districts, each governed during an air raid by a district control center. The chief of Emergency Medical Service should assign deputies to serve as medical adjutants in district control centers and to assume responsibility under the district commander for the operation of all units of the Emergency Medical Service in the district. The main control center for an area will receive reports from district centers (not from wardens) and will govern the transfer of services between districts when needed. When medical field units return to their casualty stations or hospitals, they should report immediately to their control center so that they may be used at other incidents. The district medical adjutant will report periodically to the chief of Emergency Medical Service the number of casualties in his district and, when indicated, the need for the allocation of additional hospital beds or emergency medical field units.

The chief of Emergency Medical Service will keep a daily record of new casualties and of deaths due to enemy action and will clear the record through the personnel officer of the control center to the proper municipal departments. For this purpose he must organize a casualty information service and also a mortuary service for identification and custody of the dead.

VI. CARE OF CASUALTIES IN THE FIELD

Air raid casualties are usually limited in number compared with the amount of structural damage produced by high explosive bombs. Most casualties are, however, severe. In the British experience, 40 or 50 per cent are killed outright or die soon after injury, and most of the remainder require prompt transportation to hospitals for operative procedures and resuscitation therapy. Crushing injuries, fractures, internal hemorrhage, extensive burns and shock require skilful medical judgment and attention at the site of the incident. Abdominal perforation may accompany a small penetrating lesion; head injury may cause a skull fracture or a cerebral or subdural hemorrhage without external wound. Multiple penetrating lesions of the face, eyes and other parts of the body due to fragments of glass are common and require immediate skilled attention.

As the injured are extricated from demolished buildings by rescue squads, stretcher bearers carry them to first aid posts. Medical judgment is required to classify injuries, apply first aid, administer morphine, prevent shock and indicate priority for ambulance transportation to the hospital. Responsibility for the care of air raid casualties is for trained physicians with their nurse assistants and medical auxiliaries, and not for persons with a twenty-hour course in first aid or for the corner druggist.

A. *Casualty Stations and First Aid Posts.*—The functions of casualty stations and first aid posts are outlined in Medical Division Bulletin No. 2. The casualty station is at a fixed, predetermined site, whereas the location of a first aid post is selected at the time of the incident. The casualty station should have direct telephone communication with its control center. Primarily, the casualty station is the place of assembly for one emergency medical squad consisting of two to four medical teams, each headed by a physician and including a nurse and one or more nurses' aides or orderlies, as described in Medical Division Bulletin No. 1. It is also the place of assembly for stretcher teams, who assist the medical team at the first aid post by bringing in the injured.

From the casualty station one or more medical teams may be deployed by the squad leader or on instructions

from the control center to establish temporary first aid posts near the incidents. The site selected for a first aid post should provide shelter, safety and accessibility to ambulances. The responsibility of the first aid post is to administer emergency care and to expedite transport of the severely injured to a hospital. A casualty station may serve as a first aid post if it is near the incident.

In large cities there should be one casualty station for every twenty-five thousand of population. In small cities with less population and relatively larger area it may be necessary to provide stations in double this ratio. The number and location of casualty stations are to be determined by geographic considerations as well as by the population to be served.

A casualty station serves for the reception of the less severely injured (those who can walk) and for those suffering from nervous shock or hysteria. It should have facilities for a canteen and be related to a temporary rest center for uninjured persons whose homes have been destroyed or are unsafe for occupancy. It removes the burden of a vocal but less seriously injured group from hospitals overtaxed with the care of severe casualties. Every hospital should therefore provide casualty station facilities in its outpatient clinic or other suitable place.

After a short period of observation at the casualty station, slightly injured persons may be allowed to return to their homes or to places of temporary shelter provided by the welfare department of the city or by the Red Cross. In order that persons sent home may be assured of adequate care, the chief of Emergency Medical Service should arrange with local public health nursing agencies for follow-up service. The day following an incident, a physician or a public health nurse should visit the homes of all persons who have been slightly injured. Persons needing medical care may be referred to a neighborhood physician. In this manner the neighborhood physicians in the vicinity of a casualty station may serve as "incident physicians." Those who require medical care but cannot afford a private physician should be referred to a clinic.

B. *Medical Supply Depots.*—The casualty station or some place in its vicinity is also the site of the medical supply depot, where stretchers and blankets are stored for the stretcher teams and collapsible cots, blankets and other equipment for the station itself. Here should also be based the canteen and the reclothing and rehousing services of the municipal welfare department or the Red Cross.

It may be necessary to establish a larger medical supply depot at a police or fire station or other suitable place, from which several casualty stations may be equipped. Transportation must then be constantly available at these depots. This is less desirable than the establishment of a medical supply depot at the casualty station itself.

The medical supply depot for each casualty station should include a minimum of twenty stretchers and fifty collapsible cots. At least two blankets should be available for each stretcher and cot. Additional stretchers and blankets must be provided at the hospitals for exchange with the ambulance driver when stretcher patients are received. A surplus is essential, because many stretchers and blankets will be occupied by seriously injured persons who cannot be moved. Others may have been used for the dead and must await cleaning and disinfection.

Cities in the "target areas" may require as many as two stretchers per thousand of population and three times this number of collapsible cots. They should be provided as far as possible out of local resources. This equipment will later be supplemented from federal sources.

Medical Division Bulletin No. 2 lists the medical and surgical equipment of a casualty station (list 2). The individual cases of equipment for emergency medical teams (list 1) are best stored at the hospital from which the field unit is derived; here the morphine supply can be protected and the surgical dressings replenished and resterilized. If the field unit is not related to a hospital, the individual cases of equipment for a team may remain in possession of the physician members of the team or stored in the casualty station, except for the morphine supply, which must be safeguarded in accordance with the instructions of the federal commissioner of narcotics, as outlined in Medical Division Memoranda dated Dec. 15, 1941 and Jan. 19, 1942.

The medical supply depot should also be provided with simple heating equipment and cooking utensils and a generous supply of hot water bottles or chemical heating pads.

C. *Medical Auxiliaries—Stretcher Teams.*—Trained stretcher teams are part of the Emergency Medical Service. They serve under the physician in charge at the casualty station or first aid post and are responsible for transporting the severely injured to the first aid post or to the casualty station if it is serving as a first aid post. Each casualty station will require at least four to six stretcher teams or a total of twenty trained stretcher bearers; half should be on call during the day and half at night.

Team members should be derived from the immediate neighborhood of the casualty station or hospital to which the team is attached. It will usually be necessary to organize separate day and night teams. If there are numerous casualties, stretcher team members can commandeer volunteers to assist in stretcher carrying. The regular stretcher team member serves as leader of this impromptu type of team and is responsible for proper handling of casualties.

A leader and assistant leader should be appointed for each team and a group leader for each group of teams based on a single casualty station or hospital. The group leader and at least one team leader should be selected, whenever possible, from the employees of the building used as a casualty station or from the personnel of the hospital. No member of a hospital staff who has any maintenance function should be selected for this position.

On the public alarm the group leader and at least one team leader (or assistant group leader) will report to the casualty station and remain near the telephone connected with the control center.

On order of the control center the group leader will activate teams as directed and will dispatch them to such points as may be designated by the control center. Teams should be so organized that they can be activated rapidly without recourse to public communication facilities. Activation must also be selective, so that only the teams needed are dispatched.

Technical training for stretcher bearers will consist of the standard first aid course of the Red Cross followed by supplemental training and drilling in extri-

cating injured persons from difficult positions, in loading and carrying a stretcher, and in loading and unloading ambulances.

D. *American Red Cross Units.*—In almost all communities the local Red Cross chapter is prepared to provide a variety of essential disaster relief services, such as canteen, reclothing, rehousing, auxiliary ambulance and passenger transportation. In many communities Red Cross chapters are also prepared to assist the chief of Emergency Medical Service in equipping casualty stations and medical supply depots and providing some of the personnel.

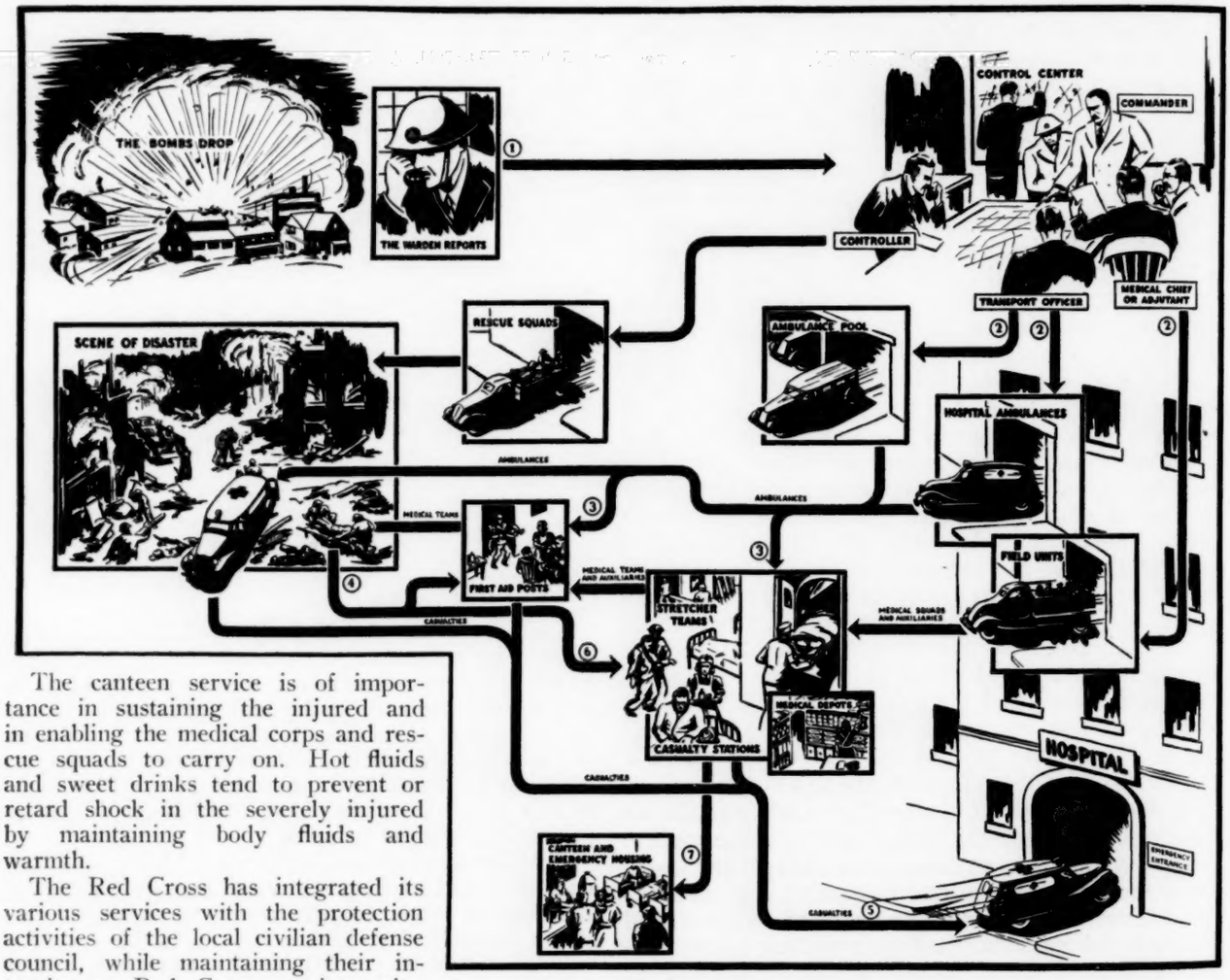


Fig. 5.—Operation of the Emergency Medical Service: 1. The warden reports on the casualties at the incident. 2. The control center orders the medical field unit of the hospital to the casualty station nearest the incident. 3. The casualty station, if close to the incident, serves as first aid post; otherwise medical teams headed by doctors are sent forward to set up advanced first aid posts to which ambulances can approach. 4. Stretcher teams carry the injured to the first aid post, from which they are transported to (5) the casualty receiving hospital as soon as possible. The slightly injured go to (6) the casualty station for temporary care until they can return home or go to temporary shelters. At or near the casualty station are (7) a medical supply depot and a canteen service station. 8. From the casualty receiving hospital the injured can later be evacuated to an emergency base hospital in a safe rural area.

The canteen service is of importance in sustaining the injured and in enabling the medical corps and rescue squads to carry on. Hot fluids and sweet drinks tend to prevent or retard shock in the severely injured by maintaining body fluids and warmth.

The Red Cross has integrated its various services with the protection activities of the local civilian defense council, while maintaining their integrity as Red Cross service units. In emergencies arising out of enemy action, the Red Cross will place its units and equipment under the direction of the commander of the citizens' defense corps.

Local welfare, feeding, housing and other relief services are primarily the responsibility of local government, and a unit to serve these functions is part of the citizens' defense corps. These government services will be supplemented by the Red Cross to the limit of its disaster relief resources. The evacuation of city populations to rural areas will be the responsibility of the state and federal evacuation authorities, under whom the Red Cross will operate. First aid training is the responsibility of the Red Cross, and when sponsored by other agencies it will be recognized officially by the Office of Civilian Defense only if given by qualified Red Cross or Bureau of Mines instructors in accordance with the Red Cross or Bureau of Mines standards approved by the Office of Civilian Defense. The Red Cross will assist in the training and organization of stretcher teams for assignment by the chief of Emergency Medical Service to casualty stations. The Red Cross also has assumed complete responsibility for training volunteer nurses' aides in collaboration with hospitals designated as training centers.

The chief of Emergency Medical Service is in charge of the operation of all units of the Emergency Medical Service under the direction of the commander of the citizens' defense corps. In some communities the local Red Cross chapter has equipped casualty stations and medical supply depots. Under the conditions of an actual air raid all organizations must work directly under central control. Otherwise the commander cannot have a complete and consistent picture of the situation. He will not be able to direct help to points where it is most urgently needed, nor will he know

when to summon outside assistance or whether he can safely send services to other areas.

E. *Local Ambulance and Other Transport Services.*—Ambulances and other vehicles for transporting casualties from an incident to hospitals will be obtained from three sources: (1) casualty receiving hospitals, (2) private ambulance companies and undertakers and (3) central ambulance depots where auxiliary trucks, converted station wagons and taxicabs are available. It is necessary to provide a central ambulance depot in each control district, so that the district commander may know the number and the location of all vehicles at his disposal. The pool may be composed of ambulances belonging to the American Red Cross and the various voluntary agencies, commercial vehicles equipped with special racks for carrying stretchers, and passenger vehicles for sitting patients.

Ambulances or passenger vehicles carrying squads of emergency medical field units and their equipment from hospitals to casualty stations will transport casualties from the incident or the first aid posts to the hospital. Other vehicles remain at their assigned central depots until instructed to move by central control. Vehicles on discharging their load at hospitals continue to move only in accordance with orders from central control. If there are no orders, they return to their depots and await further instructions.

All requests for ambulance service must pass through the district control center, which should report at once any shortage of transport to the main control center. Under conditions of raiding and blackout, shortage of transport may be due to faults in distribution rather than lack of vehicles. It is essential, therefore, that the commander have an exact knowledge of the disposition of his transport at any moment. This is not possible if ambulances move in response to local calls without reference to the control center.

Ambulance drivers should return to their depots as soon as they have carried out an order. Under blackout conditions a whole fleet of vehicles can easily be lost for hours if they do not follow instructions. They must make trips to specified points and return as soon as they have carried out instructions. Ambulance drivers must not stop on their return journey from hospitals to collect wounded from the streets; by so doing they will interfere with other ambulances and slow up the whole process of collecting the wounded.

A number of vehicles needed for a given population will vary according to geographic considerations. A minimum of one four stretcher ambulance or two two stretcher vehicles is desirable for every ten thousand of population. Specially built ambulances are not necessary; commercial trucks with or without special stretcher racks may be used. A surplus of ambulance vehicles and drivers must be registered, because they will not always be available. If hospitals are some distance from probable sites of enemy attack, a greater number of ambulances must be provided because of the long transport haul.

At hospitals and in central depots, passenger vehicles also should be available. Experience indicates the need of providing for as many sitting patients as stretcher patients.

F. *Regional or State Ambulance Service.*—Ambulances accommodating four or six stretchers, and trucks or converted busses capable of holding a larger number, should be available in the exposed seaboard areas. This service, which is distinct from the field ambulance service, should be controlled by regional or state medical officers. It is for the evacuation of patients from casualty hospitals to emergency base hospitals in protected rural sites. Ambulance trains should also be obtainable through the military authorities in exposed areas.

VII. CASUALTY RECEIVING HOSPITALS

All general hospitals in a community, voluntary as well as governmental, are included in the Emergency Medical Service. Each hospital should be specifically related to the control center and to certain casualty stations in the district in which it lies or to which its beds have been assigned.

.The chief of Emergency Medical Service may delegate to a member of the hospital staff the responsibility, as field leader, for supervising the medical and surgical equipment of the hospitals' related casualty stations and the training of their field units, whether derived from hospitals or composed of physicians of the community. This will relate all field units advantageously to hospitals, so that the clinical experience of the hospital may serve as a guide to the emergency measures employed by the field units.

All hospitals in the community should submit a daily census of vacant beds to the chief of Emergency Medical Service for transmittal to the medical adjutants at the district control centers. Hospitals must be prepared to expand their bed capacity in an emergency (1) by discharging convalescent patients to their homes, (2) by transfer of patients to other institutions and (3) by setting up additional beds in dining rooms, classrooms and other places. Additional stores of beds, mattresses and linens should be available.

To insure continuation of adequate nursing care for convalescent patients evacuated from hospitals, organizations employing public health nurses may be asked to provide for home visits. Directions for medical care to be given at home should, if possible, come from patients' private physicians. Welfare and social service organizations in the community may be called on to assist with arrangements for transfer of patients to other institutions or to their homes.

The number of casualties sent to a hospital will depend on the operating room load it is capable of handling, as well as on the number of vacant beds. Because of the severity of air raid injuries, an operating team will average less than one operation an hour. Where possible, two tables should be provided for each operating room so as to conserve the services of anesthetists, transfusion teams, nurses and orderlies, as well as equipment. The operating rooms and surgical staff of a fairly large hospital may be expected to care for only fifty major air raid casualties in twenty-four hours.

Casualty receiving hospitals must keep the control center constantly informed during an air raid of their ability to accept admissions. A hospital should notify the control center before its maximum capacity is reached, so that casualties may be diverted to another hospital. If the maximum capacity of all hospitals in a district is approached, the district control center will call on the main control center for allocation of additional beds from other districts.

When there are large numbers of burn cases, it is advisable to divide them among several hospitals. Burn cases constitute a heavy burden on the medical and nursing staff and require much care. For this reason it is advisable also to distribute burn cases among several wards of a hospital.

Medical Division Bulletin No. 3, "Protection of Hospitals," includes a description of facilities for unloading

of ambulances at the hospital during a blackout. As stretchers are unloaded, an equal number of clean stretchers and blankets must be available for exchange.

Adequate facilities and efficient administration will save lives in the receiving ward as well as in the operating room. The reception officer should be an experienced surgeon who can classify patients according to the nature of the injuries and determine need for prompt transfer to operating or resuscitation rooms. The reception room should be large. Patients should be arranged so that all can be watched by the reception officer and nurse for signs of shock or hemorrhage.

On the first manifestations of shock, the injured should be transferred to an adjacent resuscitation room where plasma and whole blood are available and a trained transfusion team is in attendance. Shock and hemorrhage should be combated before as well as during and after operative intervention. If dried or frozen plasma is employed, the transfusion teams must be familiar with the technic of preparing the plasma for injection.

VIII. EMERGENCY BASE HOSPITALS

Cities likely to be exposed to enemy action require the assistance of a state chief of Emergency Medical Service to interrelate their medical protective activities with those of adjacent localities. Under his direction a state hospital officer is required in the seaboard states to maintain an inventory of hospitals, mental institutions, convalescent homes and other medical facilities in rural areas. These facilities will serve as emergency base hospitals to which civilian casualties and certain categories of the hospital population may be evacuated from exposed cities. Direct bomb hits, the effect of blast or the proximity of an unexploded bomb may necessitate the complete evacuation of a hospital. Partial evacuation may be required to remove patients from exposed locations such as upper floors or to free beds for new casualties.

A. *Hospital Officer.*—In planning for the most efficient use of existing hospital facilities, the state hospital officer should work in close collaboration with the state evacuation authority. This is essential if emergency base hospitals and other medical and transport facilities in reception areas are to be utilized also for evacuated civilians. These recommendations are intended only for seaboard states with densely populated centers located in exposed areas which might be military objectives.

The functions of the state hospital officer are:

1. To survey hospitals throughout the state (excluding those in exposed cities) and determine how many beds can be put into immediate use with existing kitchen, laundry, sanitation and other engineering facilities by:

(*a*) Clearing patients to their homes.

(*b*) Restricting admissions.

(*c*) Using rooms not normally used for patients.

(*d*) Rehousing medical, nursing and other personnel outside the hospital.

(*e*) Using neighboring buildings (schools, hotels, and the like) for patients.

(*f*) Extra bed accommodation in temporary structures erected on grounds near the hospital.

2. To assist in designating for each casualty hospital or group of hospitals in each exposed city (*a*) the line of evacuation to the base, (*b*) the transport arrangements and (*c*) the emergency base hospitals provisionally allotted to each local casualty hospital or group of hospitals.

3. To keep constantly informed of the bed state of every hospital in his area by weekly reports.

4. To advise the Office of Civilian Defense through the regional medical officer on the need for providing additional accommodations.

5. To report to the regional medical officer of the Office of Civilian Defense any exceptional conditions requiring action (e. g. beyond state boundaries or required by the military situation) and to forward to him a monthly report on the state emergency hospital program. Where a hospital outside a state boundary is accessible for casualties from an exposed city in his area he should record this fact and include in his report any arrangements made for cooperation.

6. To maintain constant touch with the other service departments of the state defense council (e. g., evacuation).

7. To supervise the distribution of medical equipment furnished by the Office of Civilian Defense and report any threatened deficiency to the regional medical officer.

8. To supervise staff arrangements for emergency base hospitals and reception areas.

9. To control movements of medical and nursing staffs as well as of casualties in any situation affecting emergency base hospitals.

B. *Mental Hospital Inventory.*—Preparation for making a mental disease hospital available for casualties (emergency base hospital) requires the collaboration of the state officer in charge of mental institutions. It should include the following specialized inventory of the patient population:

1. Patients confined to bed and requiring hospital treatment (*a*) under restraint or isolation or (*b*) in a general ward and requiring only custodial care.

2. Ambulatory patients (*a*) requiring constant or occasional restraint, (*b*) requiring expert supervision (but not restraint) in a mental hospital, (*c*) fit for discharge to a home or institution and requiring only custodial care, (*d*) fit for discharge to their own homes under occasional supervision or (*e*) able to work under supervision in the state institution.

3. Total number of patients—male, female, children: (*a*) total for discharge, (*b*) total for work in a hospital, (*c*) total for transfer to custodial institutions, (*d*) total requiring transfer to other institutions.

IX. CASUALTY INFORMATION SERVICE

In order that information may be promptly available to relatives and friends for early identification, a casualty information service should be established in exposed communities by some responsible agency such as the health department or a joint hospital council. In an emergency it should be possible to expand the personnel with librarians and other trained persons accustomed to filing information and dealing with the public. The casualty information service will obtain the information from the chief of Emergency Medical Service and will verify its accuracy by direct communication with hospitals, police, medical examiners and morgues. It should serve under the general direction of the chief of Emergency Medical Service but should relieve him of the burden of operating the service.

The physician in charge of the medical squads or teams at an incident must keep the medical adjutant at the control center constantly informed of his casualty list and of the hospitals to which the injured have been evacuated. Casualty stations will render similar reports. During an air raid each casualty receiving hospital will report every two hours the list of casualties received.

The medical adjutants will render a daily report to the chief of Emergency Medical Service which will include the names and disposition of all injured persons. He will transmit this information to the casualty information service. He will also submit a report of the dead and their disposition, which will be transmitted to the appropriate agencies.

X. MORTUARY SERVICE

A mortuary service should be established by the police department, the medical examiner or coroner and the department of health in collaboration with the morticians. They should jointly organize the mortuary service as one of the essential protection services and should train squads of nontechnical men and women for the collection, cleansing, laying out and disposition of the dead. Undertaking establishments may be helpful in supplementing morgue facilities and providing transportation of the dead. Those who are killed in an incident should not be brought to a casualty station or first aid post. A separate room or yard should be provided at casualty stations for those who may die before transfer to a hospital. They can later be removed to morgues with the least disturbance of the population.

Provision must be made for identification of the dead, and for this purpose the police, medical examiner or other government agency must be equipped for fingerprinting and photography. At the morgue or other temporary resting place, opportunity should be provided for viewing and identification of bodies by relatives and friends.

COLONEL FINNEY TO HEAD JOHNS HOPKINS UNIT

The War Department has activated the 118th general hospital unit, which is one section of the Johns Hopkins University Hospital Unit and will be under the command of Col. George Finney, the son of Col. J. M. T. Finney, who headed the same numbered unit from Johns Hopkins when it went to France during the first world war. The 118th general hospital unit will train at Camp Edwards, Mass.

The other section of the Johns Hopkins unit, the eighteenth General Hospital, has been activated and will train at Fort Jackson, S. C.

The 42d and 142d General Hospital units from the University of Maryland Hospital also have been activated and will train at Fort Custer, Mich., and Fort Riley, Kan., respectively. According to the *Army and Navy Journal*, the unit director is Lieut. Col. Maurice C. Pincoffs.

SUMMER UNIFORM FOR ARMY OFFICERS

A lightweight khaki, single breasted, semi-form fitting sack coat, without belt, of the same design as the officers' white dress coat, has been authorized for optional wear by army officers with the khaki summer uniform, the War Department has announced. The new coat may be made from 8.2 ounce cotton twill, 7-8 ounce rayon, tropical worsted or cotton warp, mohair filling. When the new coat is worn, uniform trousers must be of the same material. Officers will not be required to purchase or wear the new coat. The summer uniform for duty consists of shirt and trousers in khaki color. At the option of the officer this coat may be worn on appropriate occasions. In the District of Columbia the summer uniform is to be worn from May 15 to October 1. Elsewhere, dates are designated to suit local climatic conditions.

INTENSIFY DRIVE FOR MORE NURSES FOR WAR DUTY

The national director of the Red Cross Nursing Service, Miss Mary Beard, stated on April 18 that the problem of supplying nurses to meet the constantly increasing demands of the Army and Navy is still a serious one, although seven thousand registered nurses from every section of the country have volunteered since Pearl Harbor for war duty through the Red Cross. This figure represents an all time peak in enrolments and is 50 per cent above the same month a year ago and more than were registered during the entire year of 1940. Nevertheless, a thousand additional trained nurses must be recruited each month this year.

Miss Beard also announced the creation of a student nurse reserve and the assignment of representatives of each of the nine army corps areas to stimulate enrolments further. Senior students in qualified schools of nursing will be given an opportunity to sign up with the Red Cross through the new student nurse reserve, and on completion of their final year and state registration they automatically become members of the reserve and eligible for assignment to the Army and Navy. Representatives in each senior class are being appointed to assist local Red Cross nursing committees to build up the new reserve. The special representatives on enrolment in the nine army corps areas will begin immediately and will assist army nurse corps captains in enrolment routines and in checking the qualifications of nurses volunteering for service with the armed forces.

The formation of many army affiliated medical units requiring from fifty to one hundred and twenty nurses each has increased further the need for nurses, and only Red Cross first reserve nurses are eligible for assignment to these hospital units, which will serve in camps here and abroad. The age limit for nurses in these units has been raised to 45 years, but for other army commissions nurses must be between the ages of 21 and 40.

ONE THOUSAND SHELTERS FOR NEW YORK CITY

One thousand rest centers or shelters are already available in New York City, it was announced April 1, where residents who have been bombed out of their homes can be fed and sheltered. Robert C. Davis, executive director of the New York chapter of the American Red Cross, said that a plan had been worked out in cooperation with the municipal officials to make rest centers available in every precinct in New York City. The Red Cross has assumed the responsibility of establishing, equipping and operating them for the temporary care of noninjured persons.

THE CHICAGO LOYOLA UNIT

U. S. Army General Hospital No. 108 is being organized at Loyola University School of Medicine, Chicago, and will be ready for preliminary training in a short time. The applicants for the fifty-seven medical positions in the unit must be graduates of Loyola, according to Dr. George T. Jordan, Chicago, director of the unit. The one hundred and twenty nurses will be from Mercy Hospital, St. Bernard's Hospital, St. Elizabeth's Hospital and Columbus Hospital in Chicago, St. Francis Hospital in Evanston and St. Anne's Hospital in Oak Park.

INSTRUCTION TO WATERWORKS OFFICIALS

An emergency water and sewerage committee has been created by the Indiana State Defense Council in cooperation with the state board of health. The secretary of the committee is B. A. Poole, chief sanitary engineer of the state board of health. According to Dr. J. W. Ferree, state commissioner of health, the committee has issued instructions to all waterworks officials concerning the protection of plants against sabotage.

SECOND HARVARD UNIT ACTIVATED

The 105th General Hospital unit from Harvard University has been activated and ordered to a far western station for training. The 5th General Hospital unit from Harvard University had been activated previously.

BLOOD BANK ON UNIVERSITY CAMPUS

A blood plasma bank is being set up in Cowell Memorial Hospital on the Berkeley campus of the University of California for civilian use in time of disaster.

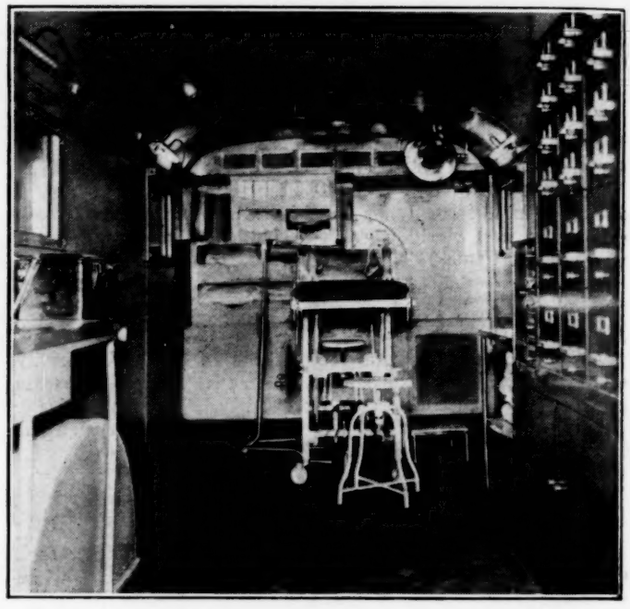
ORGANIZATION SECTION

OFFICIAL NOTES

ARMY EXHIBIT AT ATLANTIC CITY

A feature of the annual session of the American Medical Association in Atlantic City, June 8-12, will be an exhibit of the work of the Medical Department of the Army. This will occupy spaces 1-2-9U, 1-10-11V and 1-2W in the Technical Exhibit. The illustrations shown herewith indicate a portion of the exhibit. The purpose of the exhibit presented by the Medical Department Equipment Laboratory, Carlisle Barracks, Pa., is to acquaint the medical profession at large with the various types of combat and field equipment employed in the Medical Department of the United States Army. The exhibit includes such equipment as the folding leg splint, steel litter, battalion medical equipment pack carrier, new type helmets and head gear, portable disinfectors, gas proof litter covers, aerial delivery units, battalion medical carts, cross country ambulance, wheeled litter carriers, flight service chest, gas casualty chest, ambulance and mobile units of surgical hospitals.

Outside view of operating room, mobile unit, Sixth Surgical Hospital.



Interior view of operating room, mobile unit, Sixth Surgical Hospital.

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Change in Status.—H. R. 4476 has been reported to the Senate, providing for sundry matters affecting the military establishment. Among other things, the reported bill authorizes the Secretary of War, out of any moneys available for the War Department, to provide for the employment of interns who are graduates of or have successfully completed at least four years' professional training in reputable schools of medicine or osteopathy in the medical department, at not to exceed $720 per annum.

Bills Introduced.—S. 2454, introduced by Senator Walsh, Massachusetts, and H. R. 6929, introduced by Representative Vinson, Georgia, propose to prescribe the relative rank of members of the Navy Nurse Corps in relation to commissioned officers of the Navy. S. 2456, introduced by Senator Walsh, Massachusetts, and H. R. 6931, introduced by Representative Vinson, Georgia, propose to amend an act entitled "An Act to provide for the award of medals of honor, distinguished service medals and Navy crosses, and for other purposes." The bill, among other things, authorizes the President to present, in the name of Congress, a medal of honor to any person who while in the naval service of the United States shall, in the line of his profession, distinguish himself conspicuously by gallantry and intrepidity at the risk of his life above and beyond the call of duty. S. 2468, introduced by Senator George, Georgia, proposes to amend the Soldiers' and Sailors' Civil Relief Act of 1940 so as to extend its provisions to an obligation originating on or after Oct. 17, 1940, and prior to the time of induction in the service, such obligation being secured by a mortgage, trust deed or other security in the nature of a mortgage on real or personal property owned by such person at the commencement of his period of military service and still so owned by him. S. 2484, introduced by Senator Lee, Oklahoma, proposes to direct the Secretary of War to take such action as may be necessary, and as may be possible in view of the number of registered pharmacists serving in or whose services are available to the Army, to assure that a registered pharmacist is placed in charge of each Army dispensary or similar establishment from which drugs are dispensed. H. R. 6917, introduced by Representative Beiter, New York, proposes to extend the benefits of the United States Employees' Compensation Act to certain persons and to the widows, children and dependents of certain persons injured while performing duty as firemen on property under the exclusive jurisdiction of the United States. H. R. 6980, introduced by Representative Hendricks, Florida, proposes to authorize an appropriation of $1,750,000 to construct a five hundred bed capacity veterans' general medical-surgical hospital and domiciliary facility at Saint Cloud, Fla. H. R. 6982, introduced by Representative Rankin, Mississippi, proposes to amend the existing veterans' regulation regarding hospitalization to bring within its provisions any officer, enlisted man, member of the Army Nurse Corps (female) or Navy Nurse Corps (female) employed in the active military or naval service of the United States on or after Dec. 7, 1941, and before the termination of the present war. H. R. 6996, introduced by Representative Anderson, California, provides for the transfer to certain states of Farm Security Administration facilities and equipment which are used to provide shelter, medical care and sanitary facilities for migrant farm labor families.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ARIZONA

Public Health Meeting.—The Arizona Public Health Association held its annual meeting on March 13-14 in Tucson under the presidency of Robert A. Greene, Ph.D., Tucson. Among the speakers were Dr. Jerome E. Andes, Tucson, on "Chemical Substances Occasionally Introduced into Food by Accident"; Dr. George O. Hartman, Tucson, "Bacterial Enteric Infections and Intoxications," and Dr. Sydney E. Sinclair, San Francisco, "A Pediatrician's Thoughts on Mental Hygiene."

ARKANSAS

Dr. Wassell Cited for Bravery.—Dr. Corydon M. Wassell, Little Rock, who was commissioned a lieutenant commander in the U. S. Naval Reserve and assigned to caring for wounded officers and men of the cruisers *Houston* and *Marblehead*, was commended by President Roosevelt in his radio address on April 28 for heroism in Java and has been awarded the navy cross. The following is quoted from the President's address as printed in the Chicago *Tribune:*

When the Japanese advanced across the island, it was decided to evacuate as many as possible of the wounded to Australia. But about 12 of the men were so badly wounded that they could not be moved. Dr. Wassell remained with these men, knowing that he would be captured by the enemy. But he decided to make a desperate attempt to get the men out of Java. He asked each of them if he wished to take the chance, and every one agreed.

He first had to get the 12 men to the sea coast—50 miles away. To do this, he had to improvise stretchers for the hazardous journey. The men were suffering severely, but Dr. Wassell kept them alive by his skill and inspired them by his own courage.

As the official report said, Dr. Wassell was "almost like a Christlike shepherd devoted to his flock."

On the sea coast, he embarked the men on a little Dutch ship. They were bombed and machine gunned by waves of Japanese planes. Dr. Wassell took virtual command of the ship and by great skill avoided destruction, hiding in small bays and inlets.

A few days later Dr. Wassell and his little flock of wounded men reached Australia safely.

Dr. Wassell, who is 59 years of age, graduated at the University of Arkansas School of Medicine, Little Rock, in 1909. It is reported that at various times he has served as a medical missionary in China.

CALIFORNIA

Personal.—Dr. James F. Rinehart, San Francisco, has been appointed a member of the state board of health to succeed Dr. Amos Christie, San Francisco, who went to Washington to become assistant director of medical and health service of the American Red Cross. Dr. Rinehart is associate professor of pathology at the University of California Medical School, Berkeley.——Dr. Dwight M. Bissell, Salinas, has resigned as health officer of Monterey County to go to San Jose.

State Tuberculosis Meeting.—The California Tuberculosis Association held its annual session at the Ambassador Hotel, Los Angeles, April 9-11. The meeting opened with a forum on the organization and operation of a tuberculosis program. Out of state speakers included Mr. Daniel C. McCarthy, New York, on "Public Relations, Publicity and the Promotion of a Local Tuberculosis Association"; Dr. James Burns Amberson Jr., New York, "What to Do with Tuberculosis, Discovered by Case Finding" and "Features of the Early Pulmonary Infiltration," and Dr. Henry C. Sweany, Chicago, "Applications of Our Knowledge of Pathogenesis of Tuberculosis to Case Finding."

DISTRICT OF COLUMBIA

Biochemist Receives Milk Award.—George E. Holm, Ph.D., since 1920 biochemist, bureau of dairy industry, U. S. Department of Agriculture, Washington, has been awarded the Borden Company prize of $1,000 in recognition of "his contributions to the understanding of the basic causes and the control of oxidative deterioration of fats and oils, and to the prevention of spoilage of dairy products caused by the oxidation of milk fat." The prize is awarded through the American Chemical Society for "outstanding research in the chemistry of milk." Dr. Holm received his Ph.D. in 1919 at the University of Minnesota, Minneapolis.

Group Hospitalization and Doctors Hospital in Controversy.—Newspapers reported on April 25 that Doctors Hospital has given notice that after March 31, 1943 it will not renew its contract to care for patients enrolled under Group Hospitalization and also that the hospital was refusing care to any new persons signing up for group hospitalization or those whose individual contracts with Group Hospitalization, Inc., expired and have to be renewed in the meantime. The latter was said to have announced that it would take action to require the hospital to care for patients with new or renewed contracts, "even though this may require an appeal to the courts," according to the Washington *Star*. It was stated that there was no disagreement over the issue of termination of the contract between the two corporations as official notice had been served that the hospital would terminate its contract next March. It was agreed that the controversial issue was involved in the difference of opinion over whether the hospital should accept for admission G. H. I. subscribers whose contracts are written or renewed subsequent to March 31, 1942. During the negotiations over whether the contract between the two corporations should be renewed, the hospital officials said they had agreed to continue, provided G. H. I. would pay "the per diem tax cost" of G. H. I. patients. This amounted to about sixty-five cents a day, and G. H. I. refused to pay it, it was stated. Group Hospitalization is one of the nonprofit organizations formed to make available hospital facilities when needed at reasonable costs on a prepayment basis that can be met by low income groups of employees and their families.

ILLINOIS

Postgraduate Conference.—The Sixth Councilor District of the state medical society sponsored a postgraduate conference at the Lincoln-Douglas Hotel in Quincy, April 23. The following program was presented:

Dr. Walter R. Fischer, Chicago, Painful Feet.
Dr. Henry George Poncher, Chicago, Blood Dyscrasias.
Frank T. Maher, Ph.D., Chicago, The Chemistry of the New Sulfa Drugs.
Dr. Arkell M. Vaughn, Chicago, Treatment of Shock.
Dr. Charles H. Phifer, Chicago, War Medicine.
Dr. Harold M. Camp, Monmouth, What May the Medical Man Expect Regarding Military Service?

Medical Aid Plan Expanded.—The Illinois Division of Public Assistance, with the help of the state medical advisory committee appointed by the Illinois State Medical Society, has completed plans for a new medical care program for recipients of aid to dependent children and old age assistance, effective April 15. A county medical advisory committee has been appointed by each county medical society to work with the county department of public welfare and to provide professional advice through the county department relative to the quality, quantity and cost of medical care. As heretofore, the plan for physicians' services is based on free choice of physician by the patient. However, in order to facilitate understanding of the program and foster a closer relationship between the physician and the county department of public welfare, physicians are being asked to apply for placement on a roster from which the patient may choose his physician. After July 1, allowances to recipients to pay for medical care will be made only when services are given by physicians whose names are on the roster. The county department will accept applications from physicians at any time, but only those received by May 1 can be acted on by July 1, when the initial section of the roster becomes effective.

State Medical Meeting in Springfield.—The one hundred and second annual session of the Illinois State Medical Society will be held at the Hotel Abraham Lincoln, Springfield, May 19-21, under the presidency of Drs. Charles H. Phifer, Chicago. The preliminary program lists the following speakers, among others:

Dr. Frank H. Lahey, Boston, Medicine and the National Program.
Dr. Raymond A. Vonderlehr, Washington, D. C., The Detection of Venereal Disease in the Second Million Selectees.
Dr. Hobart A. Reimann, Philadelphia, Virus Disease and the Soldier.
Dr. Tom B. Throckmorton, Des Moines (subject not announced).
Dr. Lowell S. Selling, Detroit, Alcoholism and Traffic Problems.
Dr. Nathan A. Womack, St. Louis, Carcinoma of the Rectum, General Considerations.
Dr. Hedwig S. Kuhn, Hammond, Ind., Visual Problems in Modern Industry.
Carl E. Buck, D.P.H., New York, Survey of the State Department of Public Health.
Dr. Richard Paddock, St. Louis, The Third Stage of Labor.
Dr. Curtis J. Lund, Madison, Wis., Asphyxia Neonatorum.

The oration in medicine will be delivered Tuesday evening by Dr. Cecil J. Watson, Minneapolis, on "Macrocytic Anemia." The oration in surgery will be given the same evening by Dr.

Lahey on "Surgical Management of Lesions of the Esophagus, Stomach, Rectum and Colon." The secretaries' conference will be held Tuesday evening. Other groups meeting during the session of the state society include the Medical Women's Association, Illinois Society of Pathologists, Physicians' Association of the State Department of Public Welfare, Illinois chapter of the American College of Chest Physicians and the woman's auxiliary to the state medical society.

KANSAS

New Executive Secretary.—Mr. D. D. Jeffers, Pittsburg, who for two years has been working with the Crawford County Medical Society in the operation of its medical care plan for indigents, has been named full time executive secretary for the society.

University Adopts Accelerated Program.—The University of Kansas School of Medicine reports that the next freshman class will be enrolled in June. Upper classes will begin the accelerated program in the fall of 1942. Freshmen will be admitted annually in June and will complete the medical course in three years. These data supersede the information listed on page 142.

State Medical Meeting.—The eighty-third annual session of the Kansas Medical Society will be held at the Wichita Forum, Wichita, May 11-14, under the presidency of Dr. Clyde D. Blake, Hays. The medical societies of Sumner, Pratt and Cowley have cooperated with the Sedgwick County Medical Society in the preparations for this meeting. Included among the guest speakers will be:

Dr. Cyril M. MacBryde, St. Louis, Synthetic Estrogens and Their Use.
Dr. Harry E. Mock, Chicago, Management of Skull Fracture and Brain Injuries.
Dr. Alan Brown, Toronto, Ontario, Canada, Feeding Difficulties Encountered in the Newborn Period.
Dr. Frank H. Lahey, Boston, President, American Medical Association, Lesions of the Colon and Rectum.
Dr. Joe V. Meigs, Boston, Cancer of the Cervix—Changing Concepts of Treatment.
Dr. William D. Stroud, Philadelphia, Modern Therapy in Cardiology.
Dr. Paul A. O'Leary, Rochester, Minn., Modern Treatment of Syphilis.
Dr. Charles W. Mayo, Rochester, Treatment of Duodenal Ulcer.
Dr. John W. Harris, Madison, Wis., Some Practical Aspects of Pain Relief in Labor.
Dr. John J. Shea, Memphis, Tenn., Modern Treatment of Acute Infections in Otolaryngology.
Dr. Howard Rommel Hildreth, St. Louis, Detachment of Retina—Diagnosis, Management and Surgical Results.

The program includes in addition to the general sessions a group of round table discussions covering a wide range of subjects. Dr. Lahey will address the annual banquet on Wednesday evening. Other groups meeting at this time include the Kansas Obstetrical and Gynecological Society and the woman's auxiliary to the state medical society. The Kansas Medical Assistants Society will also meet on May 11 at the Allis Hotel.

KENTUCKY

Hospital News.—The Central State Hospital at Lakeland has been built at a cost of $93,000. Special ceremonies were held on March 24 to open and dedicate the institution.

Course on Industrial Health.—A nine weeks course for the senior medical students at the University of Louisville School of Medicine, Louisville, has been arranged by Dr. Walter E. Doyle, Louisville. The course will include lectures and field trips.

Personal.—Dr. Amplias W. Davis, Madisonville, has been appointed a member of the state board of health for a term ending Dec. 31, 1947, succeeding Dr. Ernest L. Gates, Greenville, whose term has expired.——Dr. Frank Marion Melton, Brandenburg, has been appointed health officer for the unit in Oldham County.

Psychiatrists Elect Officers.—Dr. John D. Reichard, medical officer, U. S. Public Health Service Hospital, Lexington, was chosen president-elect of the Kentucky Psychiatric Association recently and Dr. William K. Keller, assistant director of mental hygiene, Louisville City Hospital, was installed as president. Other officers include Drs. Abraham Wikler, Lexington, vice president, and Louis M. Foltz, Lakeland, secretary-treasurer.

LOUISIANA

School Health Survey.—The Louisiana board of health recently completed a survey to determine health needs among school children of the state. A report points out that while the group examined was small it does reflect all strata of the population of the state. A total of 779 children, of whom 353 were white and 426 were colored, was examined in seventeen parishes of the state. The examination included a general physical examination to determine nutritional status and general health conditions, a thorough dental examination, vision and hearing tests, and laboratory tests. It was found that 44 per cent of the group were judged as undernourished, 56 per cent needed some treatment or the removal of tonsils, 86 per cent had dental defects in need of correction, 10 per cent had visual defects in need of correction, 25 per cent showed defective hearing, 33 per cent had poor posture, 24 per cent of feces specimens submitted were found with intestinal parasites of one kind or another, 6 per cent of the colored children were found with syphilis and 5 per cent had doubtful reactions. None of the white children had positive serologic reactions for syphilis. In connection with the survey, 14,665 chest roentgenograms were made on grammar, high school and college students, resulting in the detection of 7 significant cases of tuberculosis; another 696 showed calcified evidence of the primary type of infection. The report points out that, if the results of this survey are true of the school population as a whole, the school children are not a healthy group and recommends a broadening of present programs in public health and public health education.

MASSACHUSETTS

Position as Medical Director Open.—Applications are being received to fill the position of full time medical director of the state medical society's prepayment medical care insurance plan. Only physicians are eligible. The salary has not as yet been fixed, but physicians interested in securing information concerning the position should communicate with Dr. Peirce H. Leavitt, 129 West Elm Street, Brockton, chairman of the committee to select the medical director. The society's plan cannot begin to function until a medical director is employed.

Regional Meeting of Chest Physicians.—The New England Chapter of the American College of Chest Physicians will hold a meeting at the Harvard Club, Boston, May 18. Dr. Aleksei A. Leonidoff, Poughkeepsie, N. Y., will speak on "Psychiatric Problem of Tuberculosis in Mental Hospitals" and Mr. Murray Kornfeld, Chicago, executive secretary of the American College of Chest Physicians, on "Chest Specialists and the War Effort." Members of the American Psychiatric Association, who will meet in Boston May 18-22, have been invited to attend the meeting.

Accelerated Training Program for Public Health Workers.—The Massachusetts Institute of Technology, Cambridge, announces a special intensive and accelerated training program for public health workers to meet the growing shortage in the profession. Clair E. Turner, Sc.D., professor of biology and public health at the institute, will direct the work to provide adequate training for public health administrators, public health engineers, public health educators and public health bacteriologists. The first period will begin on June 8 and continue through July 24. The second term will run from July 27 to September 12. In addition, a similar program for state graduate students will open on June 8 and continue through February 6. The completion of this course will lead to a degree of master of public health or a certificate in public health. Another course will be offered for public health bacteriologists and one for the training of health educators.

State Medical Meeting in Boston.—The Massachusetts Medical Society will hold its one hundred and sixty-first annual meeting at the Hotel Statler, Boston, May 25-27, under the presidency of Dr. Frank R. Ober, Boston. Among the speakers will be:

Dr. Henry E. Meleney, New York, The Problem of Certain Tropical Diseases in the War.
Dr. Raymond A. Vonderlehr, Washington, D. C., Impact of the War on the Venereal Disease Problem.
Dr. Morris Fishbein, Editor of THE JOURNAL, Chicago, American Medicine and the War.
Dr. Joseph F. McCarthy, New York, Interrelationship of Anesthesia with Analgesia.
Dr. Rolla E. Dyer, Washington, D. C., Typhus.
Mr. John M. Pratt, Chicago, World Conflict and Medical Service.
Dr. Virgil H. Moon, Philadelphia, The Vascular Dynamics, Recognition and Management of Shock.

There will be symposiums on minor psychiatric disturbances in war and civilian life and bronchial obstructions. The annual oration will be delivered Tuesday morning by Dr. William B. Castle, Boston, on "Medical Therapy." The annual dinner will be held in the evening with Dr. Fishbein and Dr. Frank H. Lahey, Boston, President, American Medical Association, as the speakers. On this occasion Dr. John F. Fulton, Sterling professor of physiology, Yale University School of Medicine, New Haven, will deliver the Shattuck Lecture on "Medicine and Air Supremacy."

MICHIGAN

Course for Operators of Milk Plants.—The School of Public Health of the University of Michigan, Ann Arbor, is offering a course for operators of milk plants, May 12-13, as a part of the civilian defense program. Instruction in health and sanitary services for the operators of pasteurization plants will be given; business and trade aspects will be left to other agencies. Among the speakers will be:

James A. Tobey, Dr.P.H., milk consultant, New York, Sanitation in Milk Plant Operation Pays Dividends.
Robert S. Breed, Ph.D., professor of bacteriology, New York, Experiment Station, Geneva, N. Y., The Problem of Bacteria in Milk.
Dr. Milton J. Rosenau, dean, School of Public Health, University of North Carolina School of Medicine, Chapel Hill, N. C., Theory and Practice of Pasteurization.
Walter von D. Tiedeman, Albany, chief, division of milk sanitation, Bureau of Engineering, New York State Department of Health, Mechanics of Pasteurization.

MINNESOTA

Annual Journal-Lancet Lecture.—Herald R. Cox, Sc.D., associate bacteriologist, U. S. Public Health Service, stationed at the laboratory in Hamilton, Mont., will deliver the second annual *Journal-Lancet* lecture at the University of Minnesota Medical School, Minneapolis, May 22. His subject will be "Typhus Fever, with Special Reference to Epidemiology and Immunity."

MISSISSIPPI

State Medical Meeting in Jackson.—The seventy-fifth annual session of the Mississippi State Medical Association will be held at the Robert E. Lee Hotel, Jackson, May 12-14, under the presidency of Dr. Augustus Street, Vicksburg. Included among the speakers will be:

Dr. Wiley R. Buffington, New Orleans, Retinal Detachment: Its Surgical Correction, Preoperative and Postoperative Care.
Dr. Theodore A. Watters, New Orleans, The Consideration of Mental Health as a Part of a State Health Program.
Dr. Don W. Gudakunst, New York, Recent Research in Poliomyelitis.
Dr. Ralph Bowen, Houston, Texas, The Practical Management of the Asthmatic Child.
Dr. Frederick A. Willius, Rochester, Minn., Hypertensive Heart Disease.
Dr. John Albert Key, St. Louis, Compound Fractures.
Dr. Leonard G. Rowntree, chief of medical division, Selective Service System, Washington, D. C., The Future of Medicine in Selective Service.
Capt. Lucius W. Johnson, U. S. Navy Hospital, Pensacola, Fla. (subject not announced).
Dr. Charles L. Williams Jr., U. S. Public Health Service, Wadesboro, N. C. (subject not announced).

At the evening session Tuesday, Dr. William A. Evans, Aberdeen, will deliver the Ewing Fox Howard Oration on "Jefferson Davis, Some of His Diseases and His Doctors." The Mississippi State Hospital Association will hold its meeting at the Heidelberg Hotel, Jackon, May 11. Its program will include panel discussions on war and hospitals and hospitalization insurance. Among others, Dr. Julius H. Hess, Chicago, will address the annual meeting of the Mississippi Pediatric Society at the Robert E. Lee Hotel, May 11, on "Celiac Disease" and "The Care of the Premature Infant." Speakers before the Louisiana-Mississippi Ophthalmological and Otolaryngological Society at the Heidelberg Hotel, May 11, will include Drs. James H. Maxwell, Ann Arbor, Mich., on "Acute Swellings of the Face and Neck"; James W. White, New York, "Surgery of the Obliques: The Indications and Contraindications," and Henry P. Wagener, Rochester, Minn., "Clinical Significance of Certain Vascular Lesions in the Retina." Dr. Murdock S. Equen, Atlanta, Ga., will deliver the Raymond Hume address on "Laryngoscopic and Bronchoscopic Studies." The eighteenth annual convention of the woman's auxiliary to the Mississippi State Medical Association will be at the Robert E. Lee Hotel, May 12-13.

NEW JERSEY

Society Refuses to Support Bill to Aid Examining Board.—The house of delegates of the Medical Society of New Jersey at its recent annual meeting in Atlantic City rejected overwhelmingly the state board's plea for support of a proposed law that would require all New Jersey physicians to contribute $2 a year each toward its support, according to the New York *Times*. Physicians who led the opposition argued the state examiners did not serve the doctors at all but served the public, and therefore the taxpayers should pay the cost. The *Times* reported that the state board of medical examiners had only $41 in its treasury. A special meeting of the board is planned for May 20 to discuss means of obtaining needed funds.

NEW YORK

State Medical Election.—Dr. Thomas A. McGoldrick, Brooklyn, was named president-elect of the Medical Society of the State of New York at its annual meeting in New York on April 28 and Dr. George W. Cottis, Jamestown, was inducted into the presidency. Dr. Peter J. Di Natale, Batavia, was elected second vice president. Other officers were reelected, according to the New York *Times*. The 1943 meeting will be in Buffalo.

New Director of Study of Parole and Family Care.—Dr. Reginald R. Steen has been given a leave of absence as first assistant physician at Kings Park State Hospital, Kings Park, to direct a study of parole and family care of the temporary commission on state hospital problems. He succeeds Dr. Frank F. Tallman, who resigned to become director of mental hygiene for the Michigan State Hospital Commission, Lansing. Central Islip (N. Y.) State Hospital, with an urban population, and the Marcy (N. Y.) State Hospital, with patients from rural areas, were selected for the study, the objective of which is to determine to what extent additional psychiatric social work results in increasing paroles and family care.

Accidents in the Home.—A five point program was drawn up at a conference in Albany in March of sixty representatives of national, state and local organizations to plan an offensive against accidents in the home and on the farm. The conference also voted to continue the farm and home safety work under the direction of the state department of health with the cooperation of the groups represented and to appoint an advisory committee to plan a state conference in Syracuse on May 29, when an institute will be held for the training of leaders in home safety, the development of committees to work in the various fields of home and farm safety and the outlining of methods. The five point program aims at determining quickly what has already been done about home and farm safety in the state, perfecting statewide organization with all possible speed, planning state, county and community conferences, disseminating to all participating groups practical information on methods of combating the problems and developing a plan for intensive follow-up work.

New York City

Symposium on Sulfonamides.—The New York Academy of Pharmacy devoted its meeting, April 30, to a symposium on the "Action and Uses of Sulfa Drugs" with the following speakers: Curt P. Wimmer, Ph.M., "Review of Chemistry and Pharmacology of Sulfa Drugs"; Dr. Elias William Abramowitz, "Sulfonamides in the Treatment of Various Skin Diseases"; Dr. Milton A. Miller, "The Sulfonamides in Nonpneumonic Conditions," and Dr. Solomon Biloon, "The Sulfonamides in Pneumonia."

Body and Mind Clinic Accused of Violating Medical Practice Laws.—The Body and Mind Foundation, Inc., of which Dr. Edward Spencer Cowles is director, is accused in an information filed by the New York County Grand Jury of having violated the state laws governing the practice of medicine, according to the New York *Times*. Simultaneously with this announcement was a report that proceedings had been started for revocation of the license of Dr. Cowles. The information named Robert Rebold and Eveline Dolin (also given as Eveline Dolin Schulman) "the self styled psychologists," as violators of the state medical laws. The information, containing five counts, charged the corporation, Rebold and Dolin, with the unlawful practice of medicine; with maintaining, operating and conducting a dispensary and clinic from May 3, 1934, up to April 15, 1942, without having first obtained a license; with displaying signs and other things on which were written the words "dispensary" and "clinic," in violation of the social welfare law; with conspiracy to violate the Education law by practicing medicine unlawfully; and the defendant Rebold alone, with violation of the Education law in that he used the title "M.D." and other designations that implied he was a practitioner of medicine. The disciplinary charges were made against Dr. Cowles by State Inspector Albert A. Bucholz, who accused the doctor of having associated with and cooperated with the Body and Mind Foundation, Inc., a corporation that he alleged was practicing medicine and of having associated with Rebold and Dolin in the illegal practice of medicine. Bucholz charged that Dr. Cowles represented his associates as licensed and qualified to practice medicine. The *Times* further reports that Dr. Cowles was accused by Inspector Bucholz of having used magazines and other publications for the purpose of advertising

contrary to the education law and to misrepresenting the purposes of the corporation, as set forth in the certificate of corporation. A charge in the petition before the grievance committee sets forth that Dr. Cowles was responsible for all the fraud, "deceitful, and wrongful unlawful acts and conduct alleged herein." Dr. Cowles, who is widely known as a psychiatrist and neurologist, founded the Body and Soul Medical and Mental Foundation in July 1923. In 1934 the clinic changed its title to The Body and Mind Foundation, Inc., and moved to the East Sixty-Ninth Street address, where thousands have attended the clinics, which became the subject of much comment. It was stated that twelve state investigators made repeated visits to the clinic. The investigators found 200 to 300 patients being treated at once for individual ills, the most frequent treatment consisting of taking a stimulant and listening to suggestions by doctors and other patients that they were getting better, it was stated. Dr. Cowles graduated at University College of Medicine, Richmond, Va., in 1907.

NORTH CAROLINA

Society Opposes Construction of New Hospital.—The Cumberland County Medical Society on April 6 appeared before the board of county commissioners in opposition to the erection of a $400,000 hospital in Fayetteville by the federal government, newspapers reported. After hearing the opposition, the commissioners stated that nothing could be done to halt the project. The society contended that there are more than a sufficient number of hospital beds in the county to meet the requirements, that no patient has been refused admittance to any hospital in the county for lack of space, that the construction of such an institution would be unwise at this time because of material needs, that doctors and nurses probably could not be secured to staff the hospital and that the county has no right to operate a hospital without a mandate of the people.

NORTH DAKOTA

State Medical Meeting in Jamestown. — The North Dakota State Medical Association will hold its annual meeting in Jamestown, May 18-20, under the presidency of Dr. Frederick W. Fergusson, Kulm. The speakers will include:

Dr. Ralph A. Reis, Chicago, Obstetrics.
Dr. Erling S. Platou, Minneapolis, Pediatrics.
Dr. Stanley R. Maxeiner, Minneapolis, Fractures.
Dr. W. Wright, Bethesda, Md., Trichinosis.
Dr. Lawrence R. Boies, Minneapolis, Symptom of Headache.
Dr. Gordon R. Kamman, St. Paul, The Depressed Patient.

Dr. Edward C. Rosenow, Rochester, Minn., and Herald R. Cox, Sc.D., Hamilton, Mont., will participate in a symposium on "Infectious Encephalomyelitis." The North Dakota State Health Officers Association will meet on May 18 and the North Dakota Academy of Ophthalmology and Otolaryngology on May 19.

OHIO

New Supervisor of Health.—Paul E. Landis, associate professor of physical education at Bowling Green State College, Bowling Green, has been named state supervisor of health, physical education, recreation and safety, effective March 1. This position was created within the department of education to cooperate with federal defense agencies now promoting a program "for improving the health and physical status of the people," according to *Ohio Public Health*. Mr. Landis received his M.A. degree at Teachers College, Columbia University, New York.

Grant for Study of Adolescent Children.—The General Education Board of the Rockefeller Foundation has given the Brush Foundation of Western Reserve University School of Medicine, Cleveland, a supplementary grant of $15,000 for one year to be used in completing its study of the growth and development of adolescent children. The study was begun in 1935 by the late Dr. T. Wingate Todd and has been continued by William Walter Greulich, Ph.D., director of the Brush Foundation and professor of physical anthropology and anatomy in the school of medicine.

OREGON

Personal. — Dr. Irvin R. Fox, Eugene, and J. L. Ingle, D.O., La Grande, have been reappointed members of the state board of medical examiners.——Dr. Edward J. Dehne, Coquille, health officer of Coos County, has been ordered to active duty with the army. —— Dr. Vernon A. Douglas, Salem, health officer of Marion County, has been appointed medical officer for the Oregon state defense council.

PENNSYLVANIA

Additional Care for Blind. — Plans are under way to launch a new expanded program providing additional care for blind and visually defective persons in Pennsylvania. The program was authorized by the last general assembly. The state council for the blind will administer the plan, which will be far more comprehensive than the state's past activities for the blind and visually defective persons. Regional supervisors will be assigned to various sections of the state to carry on the work in defined areas, according to the *Pennsylvania Medical Journal*.

Philadelphia

The Jarecki Lecture. — The eighth Edwin A. Jarecki Memorial Lecture was delivered at Jewish Hospital on April 23 by Dr. Elliott P. Joslin, Boston. His subject was "The Responsibility of Being a Diabetic."

New Professor of Proctology.—Dr. Harry E. Bacon has been elected professor and head of the department of proctology at Temple University School of Medicine. Dr. Bacon is a native of Philadelphia and graduated at Temple in 1925. He is co-founder and past president of the Proctologic Society of the Graduate Hospital of the University of Pennsylvania, according to an announcement.

Endocrine Clinic Opened at Jefferson.—A new clinic has been organized at Jefferson Medical College of Philadelphia for clinical research and teaching of endocrinology. It will also function in the diagnosis and treatment of endocrinopathies. Dr. Karl E. Paschkis, J. Ewing Mears Teaching and Research Fellow in Physiology and Medicine, is the chief clinical assistant.

SOUTH CAROLINA

Personal.—Dr. William Weston Sr., Columbia, was presented with a silver platter and scroll by the Columbia Medical Society at a meeting, March 10, in honor of his "outstanding work and contributions to the society."

First Case of Smallpox in Years.—Spartansburg newspapers reported recently that 924 residents of the Glendale section were vaccinated against smallpox, following the report of 1 case of the disease, the first in several years in South Carolina.

The Sims Lecture.—Dr. Tinsley R. Harrison, professor of medicine, Bowman Gray School of Medicine of Wake Forest College, Winston-Salem, N. C., delivered the second annual J. Marion Sims Lecture on April 17 at the Medical College of the State of South Carolina, Charleston. His subject was "Cardiac Dyspnea."

SOUTH DAKOTA

Accelerated Program Adopted by University.—Since the compilation of table 2 on page 143 in this issue of THE JOURNAL the University of South Dakota School of Medical Sciences, a school of the basic medical sciences, has announced the adoption of the accelerated program. Classes will begin on June 15 for both years and end on Feb. 23, 1943. The subsequent freshman class will begin on March 8, 1943.

TENNESSEE

State Medical Election.—Dr. Oval N. Bryan, Nashville, was chosen president-elect of the Tennessee State Medical Association at its annual meeting in Memphis, April 16, and Dr. James B. Stanford, Memphis, was inducted into the presidency. Vice presidents are Drs. Samuel J. Fentress, Goodlettsville, for the Middle Tennessee area; Featherston Douglass, Dyer, for West Tennessee, and Burton L. Jacobs, Chattanooga, for the East Tennessee area. Dr. Harrison H. Shoulders, Nashville, was reelected secretary-editor.

TEXAS

Special Society Elections.—Dr. Eugene L. Aten, Dallas, director of the Dallas Child Guidance Clinic, was chosen president of the Texas Society for Mental Hygiene at its recent annual meeting in Fort Worth. Miss Lucile Allen, Dallas, is secretary-treasurer. The next annual session will be in Dallas. Out of state speakers at the recent meeting included Drs. George S. Stevenson, New York, and Horton R. Casparis, Nashville, Tenn.——Mr. A. C. Seawell, administrator of the City and County Hospital of Fort Worth, was chosen president-elect of the Texas Hospital Association. Mrs. Margaret H. Rose, R.N., superintendent Wichita General Hospital, Wichita Falls, is president and Miss Madelyne Sturdavant, R.N., Methodist Hospital, Dallas, is executive secretary.

PHILIPPINE ISLANDS

Dr. Whitacre Interned in Manila.—Dr. Frank E. Whitacre, professor of obstetrics and gynecology at the Peiping Union Medical College, Peiping, China, is interned in Manila, newspapers reported, March 31. He with his family was evacuated from Peiping but remained in Manila when his wife and her sister returned to the United States.

PUERTO RICO

Blood Bank at School of Medicine.—The School of Tropical Medicine, San Juan, started the operation of a blood bank at the school on April 7 in connection with a program of civilian defense. Among the speakers of the occasion were Dr. Oscar G. Costa-Mandry, Dr. Eduardo Garrido Morales, Mr. Jaime Annexy, Dr. Pablo Morales Otero and Dr. Artajerjes Oliveras-Guerra, all of San Juan.

Water Borne Outbreak of Typhoid.—Thirteen cases of typhoid with two deaths were recently reported in an outbreak in the municipality of Juana Diaz, which has a population of 23,396. The 13 cases were evenly distributed over the town. An investigation disclosed the public aqueduct to be the only factor common to all the patients. A resident living a few yards from a dam at the source of water supply was found to be a typhoid carrier and gave a history of having defecated above the impounding place of the water, which is served without any protection or treatment to the inhabitants of the town of Juana Diaz. No other case appeared after the public water was properly chlorinated.

GENERAL

First Award of Nutrition Grants.—The Nutrition Foundation, Inc., recently organized with the support of the food industry, announces that its first series of grants will be made to promote research and education in the science of nutrition, effective July 1. The grants will be made following action to be taken by the foundation trustees at their May meeting.

Meeting of Laryngologists.—The American Laryngological Association will hold its sixty-fourth annual meeting at the Marlborough-Blenheim Hotel, Atlantic City, May 25-27, under the presidency of Dr. Thomas E. Carmody, Denver. Included among the speakers will be:

Dr. Thomas C. Galloway, Evanston, Ill., Infection with Anaerobic Streptococci with Special Reference to Cranial Osteomyelitis.
Dr. Daniel S. Cunning, New York, Chemotherapy, Especially the Use of the Newer Sulfocompounds in Nose and Throat Diseases.
Drs. Frederick A. Figi and Charles H. Watkins, Rochester, Minn., The Treatment of Hereditary Telangiectasia of the Nose.
Dr. E. Fernandez Soto, Havana, Cuba, Contribution to the History of Laryngology in Cuba.
Dr. Oscar V. Batson, Philadelphia, The Veins of the Pharynx.
Dr. Maurice Lenz, New York, X-Ray Therapy of Diseases of the Larynx.

Medical Bowling Tournament Canceled.—The annual tournament planned by the American Medical Bowling Association in Atlantic City, June 8-12, has been canceled. Instead a national medical bowling sweepstakes will be held on June 6, played on a handicap basis on the home alleys in the cities from which the teams may enter. The sweepstakes has been given an official sanction by the American Bowling Congress and will be played under the rules of that organization. The sweepstakes will be for five man teams, doubles, singles and all events to establish the national champions for these various events. Teams will be handicapped on a two thirds basis from 950, doubles on a two thirds basis from 380 and singles on a two thirds basis from 190. The team play will be in the afternoon of June 6, the doubles and singles in the evening. Entries will close at midnight May 23. This is necessary because every entry must be checked by the American Bowling Congress. Entry blanks may be obtained from Dr. Joseph J. Jelinek, 1052 West Sixth Street, Los Angeles, acting secretary of the American Medical Bowling Association.

Knudsen Award Goes to Clarence Selby.—The W. S. Knudsen Award of the American Association of Industrial Physicians and Surgeons has been presented to Dr. Clarence D. Selby, Detroit, since 1935 medical consultant to the General Motors Corporation, for "the most outstanding contribution to industrial medicine." The presentation took place during the association's annual meeting in Cincinnati on April 15. Dr. Selby was born in Des Moines on July 21, 1878. He graduated at the Western Reserve University School of Medicine, Cleveland, in 1902. During his career he has served as commissioner of health of Toledo, Ohio, consulting hygienist of the U. S. Public Health Service, secretary and chairman of the Section on Preventive Medicine and Public Health and Industrial Medicine, American Medical Association, and since 1938 as a member of its Council on Industrial Health. Since 1940 he has been chairman of the subcommittee on industrial health and medicine, Office of Defense Health and Welfare Service, Office of Emergency Management. In 1938 he was president of the American Association of Industrial Physicians and Surgeons, in 1925 of the Ohio State Medical Association, in 1923 of the Ohio Public Health Association and from 1922 to 1928 of the Toledo Public Health Association. The Knudsen award was established in 1938 by William S. Knudsen, then president of the General Motors Corporation.

Association on Mental Deficiency.—The sixty-sixth annual meeting of the American Association on Mental Deficiency will be held at the Hotel Bradford, Boston, May 13-16, under the presidency of Dr. Fred O. Butler, Eldridge, Calif., whose address will be entitled "The Defective Delinquent." Among other speakers will be:

Dr. Hubert H. Ramsay, American Fork, Utah, How the High Grade Mentally Defective May Help in the Prosecution of the War.
Dr. Edgar C. Yerbury and Nancy Newell, Ed.M., Boston, Factors in the Early Behavior of Psychotic Children as Related to Their Subsequent Mental Disorder.
Dr. Clemens E. Benda, Wrentham, Mass., Congenital Syphilis in Mental Deficiency.
Emily M. Bixby, Ph.D., Wrentham, Hormone Studies in Mongolism.
Dr. Raymond W. Waggoner, Ann Arbor, Mich., Agenesis of the White Matter as an Hereditary Disorder.
Dr. Charles Stanley Raymond, Wrentham, Mental Deficiency as a Community and Institutional Problem.
Dr. Douglas A. Thom, Boston, Psychiatric Problems of Children in Time of War.
Dr. Lowell S. Selling, Detroit, Feebleminded Drivers.
Dr. George A. Jervis, New York, Histologic Studies of Brain Cortex in Certain Types of Mental Defect.

The program will conclude Saturday morning with a symposium on educational provisions for mentally deficient adolescents.

CANADA

Outbreak of Poliomyelitis.—Thirteen cases of poliomyelitis with one death were reported on April 20 in an outbreak in the parish of Drummond, Victoria County. The youngest patient was 20 months old and the oldest 11 years.

Personal.—Dr. John H. Holbrook, Hamilton, Ontario, superintendent of the Mountain Sanatorium, was presented with the city's outstanding citizenship medal for 1941 recently for his efforts over a period of thirty years to cut the death rate from tuberculosis in the city.

Government Services

Narcotic Hospital to Be Used for Mental Patients

The U. S. Public Health Service Hospital at Fort Worth, used since its opening in 1938 for the care and treatment of narcotic addicts only, will soon be used for the treatment of mental patients also, according to the Fort Worth *Star-Telegram*. An initial group of 150 mental patients will be transferred from St. Elizabeths Hospital, Washington, D. C. Dr. Grover A. Kempf, former medical officer in charge of the U. S. Marine Hospital, Boston, a psychiatrist, was recently appointed officer in charge of the Fort Worth hospital. He succeeds Dr. William F. Ossenfort, Fort Worth, head of the hospital since its opening, who has been appointed assistant surgeon general of the public health service in charge of the hospital division.

Physical Fitness Division Abolished

The Division of Physical Fitness, formerly part of the Office of Civilian Defense, was abolished on April 15 by Federal Security Administrator Paul V. McNutt, according to the New York *Times*. Many of the staff members were dismissed, effective May 1, and their activities absorbed immediately by Mr. McNutt's Office of Defense Health and Welfare Services. The director of the division, John B. Kelly, will continue in the new setup with the title of assistant director of defense health and welfare services. He will have no office in Washington and no authority outside Philadelphia, it was stated. All of the sports "coordinators" whom Mr. Kelly named throughout the country to promote recreational activities were dropped by Mr. McNutt, although he said in a statement that he hoped they would continue to promote "these vital community programs" on their own, the *Times* reported.

Foreign Letters

LONDON

(From Our Regular Correspondent)

March 21, 1942.

British Doctor Dies of Typhus in German Camp

Major A. Keith Gibson, a Scottish doctor in the Army Medical Corps, has died of typhus in a German prison camp. He contracted the disease from Russian prisoners whom he was attending. Under the Geneva convention a medical prisoner of war cannot be asked to assist in the treatment of infectious diseases. It is stated that Dr. Gibson volunteered to help to relieve the acute miseries of the Russians. In a report to the Swiss Red Cross the German medical authorities pay tribute to his self sacrifice, and he was buried with full military honors. He worked hard in caring for the men constantly being sent into the camp hospital. He was ill for a fortnight, during which his fellow prisoners worked night and day to save his life. He was captured at Boulogne after the evacuation of Dunkirk. Until December 1939, when he volunteered for military service, he was regional secretary of the London area of the British Medical Association.

Anglo-Soviet Medical Relations

Before the war there was little cultural interchange between Britain and the Soviet Union, owing to some dislike in each country for the political system of the other. The war has now brought them together and done something to dispel prejudices on both sides as well as to encourage closer relations. An example is the formation of an Anglo-Soviet medical committee, of which Sir Alfred Webb-Johnson, president of the Royal College of Surgeons, is chairman. The January issue of the *Postgraduate Medical Journal* is entirely devoted to Soviet medicine. In a foreword Russian ambassador Maisky states that an exchange of medical experiences both in time of peace and in time of war will prove of immense benefit to both countries. Sir Alfred Webb-Johnson as president of the Anglo-Soviet committee contributes an introduction in which he welcomes the special issue devoted to Anglo-Soviet medicine.

Dr. D. E. Bunbury, honorary secretary of the Anglo-Soviet Medical Committee, says that the most urgent aim is transmission of English material to the Soviet Union. The other side of the picture is to make available here translations of Russian medical literature. English journals, including the *Bulletin of War Medicine*, have been dispatched to Russia; also reviews of recent work on malaria, maxillofacial injuries and the treatment of burns and acute war neuroses.

Employment of Alien Physicians in Hospitals

The calling of physicians for the fighting forces has produced a shortage of those available for hospitals, which is being remedied by the employment of alien physicians subject to regulations issued by the Ministry of Health. The maximum proportion of alien to British physicians employed as residents by any hospital was laid down. As this regulation has been found too restrictive in certain cases, it has been relaxed. It was laid down that not less than two British resident physicians should be employed in any hospital employing an alien physician. The necessary number has now been reduced to one. For the hospitals which employ only one resident physician there is a further relaxation allowing them to employ an alien if the prior consent of the minister of health has been obtained. Larger hospitals are permitted to employ a greater percentage of alien physicians. The minister of health stresses the valuable assistance in meeting the pressing problem of medical man power by the employment of alien physicians.

British Medical Unit for China

The offer of the British Red Cross to send a unit to China has been accepted. It will consist of full equipment for a hospital of two hundred beds and a staff of twenty-six consisting of an administrator, four surgeons, three physicians, a pathologist, a radiographer, a storekeeper accountant, a matron and fourteen nurses. Dr. Wellington Koo, the Chinese ambassador, has informed Field Marshal Sir Philip Chetwode, chairman of the executive committee of the St. John War Organization, that the Chinese have accepted the offer with deep appreciation. The unit will cooperate with the Chinese Red Cross and the British Fund for the Relief of Distress in China. Physicians and nurses who have a knowledge of Chinese are invited to communicate at once with the secretary of the Medical Aid to China Sub-Committee, 14 Grosvenor Crescent, London, S. W. 1.

The American Hospital in Britain

The duchess of Kent has opened the new Churchill Hospital at Headington, near Oxford, which is to be the home of the American Hospital in Britain. This project was made possible by an American organization, the British War Relief Committee, a representative of which, Mr. Bertram de N. Cruger, attended the opening ceremony. About two thirds of the new hospital will be orthopedic, and it will form part of the Oxford Orthopedic Center. It will be in charge of Professor Wilson, who has brought over in addition to orthopedic surgeons Dr. John M. Converse for plastic surgery, Dr. Rogers of McGill for general surgery and Dr. Kirkland, who will take charge of medicine and clinical pathology. The present staff includes twelve American doctors and fifty American and Canadian nurses. The hospital contains six hundred beds and, because of air raids, is constructed on a novel plan. The wards are built round a courtyard, and each has its own air raid shelter. In its previous hospital, at Basingstoke, Professor Wilson's unit has American surgeons trained in the methods of war surgery. It is hoped that the Churchill Hospital may eventually be taken over by the American army as its first base hospital in Europe.

Polish Professor Honored

At the annual Buckstone Browne luncheon of the Royal College of Surgeons the honorary fellowship was conferred on Prof. Antoni Jurasz, dean of the Polish Faculty of Medicine in Edinburgh University (THE JOURNAL, March 29, 1941, p. 1469). The president, Sir Alfred Webb-Johnson, said that, in common with the whole civiiized world, Britain had been horrified by the calculated brutality of the treatment of the Poles and by the deliberate plan to destroy their centers of intellectual life. Though Poland held a premier place among the persecuted peoples of the world, her national culture had survived all attempts to destroy it. The first essential step toward restoration was training young men and women for the task. We had been deeply impressed by the remarkable achievement of establishing a Polish faculty of medicine in the University of Edinburgh. In reply Professor Jurasz said that it was only through this war that the great Western democracies had come fully to realize that in a nation's struggle for life the decisive factor was not the number of inhabitants, their wealth or the absolute superiority of their armed forces, but the spirit inherent in each individual.

Some Increase in Tuberculosis

It has been stated in previous letters that the national health during the war has improved. In the case of a few diseases there has been some slight increase. The most important increase is in tuberculosis, which was also observed to increase in the war of 1914-1918. A progressive decrease in the inci-

dence of this disease has been going on since 1919, but in 1940, the first complete war year, the mortality showed a rise, which was most noticeable in young women between the ages of 15 and 25. Their death rate per million rose from 762 in 1939 to 881 in 1940, compared with a rise in the tuberculosis death rate of all ages for both sexes from 535 to 587. More recent figures for the first quarter of 1941 show a slight decline compared with the corresponding quarter of 1940.

The minister of health has issued a circular to the local health authorities pointing out the importance under war time conditions that both the preventive and the curative arrangements for tuberculosis should be fully maintained. He urges them to review their present arrangements for care and aftercare and wherever possible to improve and extend them. If more bed accommodation is required than is available in any district, cooperative arrangements should be sought with neighboring authorities. In many districts the problem of adequate nursing is even more acute. The minister is endeavoring to remedy the shortage of nurses by encouraging recruitment.

RIO DE JANEIRO

(From Our Regular Correspondent)

April 16, 1942.

Malaria in the Amazon Basin

The total mobilization of the resources of the Western Hemisphere has emphasized the paramount problem of protecting the health of laborers in the tropical sections of the Americas, especially those in the Amazon Valley in South America, where there are millions of native rubber trees loosely scattered over the largest fluvial basin of the world. Although the Amazon is not the longest river, its basin is the largest (2,500,000 square miles, against 1,275,000 of the Mississippi-Missouri). Of this enormous basin, 1,288,500 square miles are malaria infested jungles within the largest two states of Brazil—Amazonas and Para—and the national Acre Territory, the latter on the upper river near the Peruvian border. The area of these two states and the Acre Territory corresponds to 43 per cent of continental United States and 39 per cent of the whole of Brazil. The health condition of the Amazon Basin has again been brought to the public attention by the arrival in Rio de Janeiro a few days ago of two American experts, Dr. George Dunham, director of the Health Division of the Bureau of the Coordinator of Inter-American Affairs, and Dr. George Saunders, tropical diseases specialist, who are here to confer with the federal health authorities before leaving for the Amazon region.

From time to time scientific expeditions are sent to survey the Amazon region and reports have been published. This great region and its population, largely consisting of native Indians and immigrants from the semiarid northeastern section of Brazil, is periodically subjected to half starving droughts. Among the health surveys is the valuable one conducted by Oswaldo Cruz in the first decade of the present century. One of the consequences of this survey was the establishment of a plan of malaria control for the valleys of the Madeira and Mamore rivers, two great tributaries of the Amazon, which has permitted the construction of the Madeira-Mamore Railroad, creating a sure connection with Bolivia and thus opening an important section of the Andes plateau into the Atlantic littoral. The malaria control plan designed by Oswaldo Cruz, the execution of which permitted the gathering of thousands of laborers in the heart of the equatorial jungle, was a sanitary feat comparable to the work of Gorgas in Panama. In the Amazon region there are malaria, hookworm disease, yaws, amebiasis, leishmaniasis, yellow fever, leprosy, syphilis and food deficiency diseases. But malaria is the most important health problem. The total population of the region is 1,480,000, or 1.1 inhabitants per square mile, and there are only two cities of middle size: Belem, at the mouth of the Amazon River, with 109,000 population, and Manaos, in the interior, with 210,000. The rest of the population is scattered in a hundred settlements of 500 to 8,000 each, mainly occupied in agriculture (rubber, Brazil nuts, timber) and fishing.

During 1941 the Federal Health Service, in cooperation with the health departments of the states of Amazonas and Para, conducted a special survey in many of these settlements to make it possible to lay out a plan of malarial control. It has been planned to use experts and technicians from Rio de Janeiro and São Paulo to ascertain many important features of the biology of the Anopheles fauna of the Amazon and the extent and severity of the disease. The findings of the survey have just been published in the 1941 annual report of the General Director of the Federal Health Service. According to the report the principal carriers of malaria in the Amazon region are Anopheles albitarsis, Anopheles darlingi, Anopheles oswaldoi, Anopheles pessoai, Anopheles tarsimaculatus and Anopheles triannulatus. In the coastal districts the most important vector is A. albitarsis; in the hinterland the predominant carriers are the tarsimaculatus and triannulatus species. The forty-nine settlements that have been surveyed aggregate a total population of 90,000, out of which more than 18,000 individuals have been examined. In all the forty-nine surveyed settlements the malarial disease is endemic. The splenic index of these localities has been found to vary from 0.2 to 73, with the median value of 24; the hemoscopic index has been found between 0 and 39, with the median value of 7.5. The studies are in progress now, and it is expected that they may be accelerated in order to enable the health authorities soon to begin the real control work, with the invaluable cooperation of the coordinator of Inter-American affairs, through the action of Dr. Dunham and Dr. Saunders as field representatives of that agency.

Marriages

ARTHUR M. GREENE, Omaha, to Miss Deborah Brunn of Long Island, N. Y., in Panama City, Panama, recently.

JOHN LUTHER SHIREY, Mount Pleasant, N. C., to Miss Peggy Elaine Johnson in Birmingham, Ala., in March.

EARL CUNNINGHAM MACCORDY to Miss Regina Barbara Melber, both of St. Petersburg, Fla., March 4.

NORMAN F. PEACOCK, Crawfordsville, Ind., to Miss Margaret Weakley of Fort Thomas, Ky., January 10.

IRWIN WARREN WINFIELD, New York, to Miss Carol Estelle Lehman in White Plains, N. Y., March 29.

LEONARD J. ABRAMOVITZ, Baltimore, to Miss Jeanne Elizabeth Daubert of Tannersville, Pa., February 22.

MALCOLM M. DUNHAM, Woodbridge, N. J., to Miss Gladys L. Bitting of Marysville, Pa., March 8.

CREIGHTON WRENN to Miss Charlotte Hutson Martin, both of Mooresville, N. C., in February.

WESLEY LEONARD FURSTE II, Cincinnati, to Miss Leone James of St. Clairsville, Ohio, March 28.

SAMUEL PHILLIPS ASPER JR., Boston, to Miss Ann White Carver of Baltimore, March 13.

JOHN PHILLPS MOORE, Ocala, Fla., to Miss Martha Helen Olsen in Jacksonville, March 1.

ERNEST JEFF HOLDER to Miss Vivian Elizabeth Boykin, both of Prentiss, Miss., January 17.

GLENN MITCHELL SHIFLEY, Louisville, Ky., to Miss Geneva Peace of Pikeview, March 13.

HORACE E. JONES, Anderson, Ind., to Miss Patricia Harden of St. Louis, January 30.

JOHN FRANCIS LING, Hebron, Ind., to Miss Mildred Thomas of Madison, February 1.

ROBERT J. HALEY SR., Paragould, Ark., to Mrs. Jewell Bradsher, January 4.

GEORGE F. JOSEPHSON to Miss Mildred Oremland, both of Brooklyn, recently.

Deaths

Mary Luise Diez, Boston; Woman's Medical College of Pennsylvania, Philadelphia, 1903; member of the Massachusetts Medical Society and the New England Society of Psychiatry; director, division of child hygiene, Massachusetts Department of Public Health; obstetrician, division of maternity, infancy and child hygiene, New York State Department of Health from 1922 to 1926 and associate director from 1926 to 1929; associate in surgery, West Philadelphia Hospital, Philadelphia, from 1909 to 1920 and visiting chief obstetrician at the Woman's Hospital, Philadelphia, during the same time; instructor in child hygiene at the Harvard School of Public Health; special lecturer on child hygiene, department of nursing, at Simmons College; aged 62; died, April 12, in the Massachusetts General Hospital, Boston.

Edward Frost Geddings ✠ Lieutenant Colonel, U. S. Army, retired, Chevy Chase, Md.; Medical College of the State of South Carolina, Charleston, 1890; in October 1900 entered the medical corps of the U. S. Army as an assistant surgeon; rose through the various grades and was commissioned a lieutenant colonel May 15, 1917; retired Nov. 1, 1919 for disability in line of duty; veteran of the Spanish-American War and World War I; aged 73; died, January 6.

Elbert Mortimer Somers, Sharon, Conn.; University of the City of New York Medical Department, New York, 1893; served during World War I; formerly resident officer at the Hudson River State Hospital, Poughkeepsie, N. Y.; for many years connected with the New York State Hospitals for the Insane; aged 71; died, February 8, of arteriosclerosis and cerebral hemorrhage.

Henry Robertson Skeel ✠ New York; Columbia University College of Physicians and Surgeons, New York, 1913; member of the Association for Research in Ophthalmology, Inc.; served during World War I; served in various capacities on the staff of the Manhattan Eye, Ear and Throat Hospital; aged 56; died, March 22, of coronary thrombosis.

Norman W. Bellrose, Eaton, Colo.; University of Vermont College of Medicine, Burlington, 1889; member of the Colorado State Medical Society; past president of the Weld County Medical Society; formerly mayor, health officer and member of the school board; aged 77; died, February 24, in the Greeley (Colo.) Hospital of cardiac decompensation.

Hubert Raymond Stiles, Chazy, N. Y.; University of Vermont College of Medicine, Burlington, 1918; coroner of Clinton County; served during World War I; health officer of the town of Chazy since 1926 and of the town of Beekmantown since 1936; aged 49; died, February 10, of bilateral pyonephrosis with calculi and uremia.

John Gardiner Huck, Hydes, Md.; Johns Hopkins University School of Medicine, Baltimore, 1918; formerly assistant professor of medicine at the University of Maryland and College of Physicians and Surgeons, Baltimore; aged 50; died, March 17, in the Union Memorial Hospital, Baltimore, of cerebral hemorrhage.

Edward James Kevlin, Ponchatoula, La.; Medical Department of Tulane University of Louisiana, New Orleans, 1904; formerly secretary of the Tangipahoa Parish Medical Society; member of the local and Tangipahoa parish school boards; aged 62; died, February 4, of bulbar paralysis and amyotrophic lateral sclerosis.

George M. Decherd, Austin, Texas; University of Texas School of Medicine, Galveston, 1905; member of the State Medical Association of Texas; formerly city health officer; for many years a member and at one time president of the school board; aged 61; died, February 26, of coronary occlusion.

John Flavius Dunn, Arlington, Ky.; Hospital College of Medicine, Louisville, 1905; member of the Kentucky State Medical Association; past president and secretary of the Carlisle County Medical Society; owner of a hospital bearing his name; aged 61; died, March 7, of coronary thrombosis.

Orland Paul Shippey ✠ Saguache, Colo.; Gross Medical College, Denver, 1895; past president of the San Luis Valley Medical Society; county health officer; aged 68; died, February 9, in the Denver and Rio Grande Western Railroad Hospital, Salida, of coronary thrombosis.

Philip Finkle ✠ Miami Beach, Fla.; Columbia University College of Physicians and Surgeons, New York, 1918; fellow of the American College of Physicians; for many years on the staff of the Mount Sinai Hospital, New York; aged 47; died in March of coronary thrombosis.

David Selman, Cleveland; Western Reserve University Medical Department, Cleveland, 1911; member of the Ohio State Medical Association; served during World War I; aged 55; died, February 3, at his home in Cleveland Heights of acute coronary insufficiency.

Paul John Alspaugh ✠ New Philadelphia, Ohio; Starling Medical College, Columbus, 1906; on the staff of the Union Hospital, Dover; member of the medical advisory board of the Selective Service System; aged 63; died, March 10, of dilatation of the heart.

Samuel Paul Sobel ✠ New York; Columbia University College of Physicians and Surgeons, New York, 1906; member of the National Gastroenterological Association; on the staff of the Bronx Hospital; aged 59; died, February 14, of carcinoma of the pancreas.

Frederick P. P. Von Keller ✠ Ardmore, Okla.; Universität Heidelberg Medizinische Fakultät, Baden, Germany, 1888; medical superintendent of a hospital bearing his name; aged 82; died, February 13, of carcinoma of the pylorus and cirrhosis of the liver.

Roderick Donald McRae ✠ Hunters, Wash. (licensed in Washington in 1900); formerly physician for the Indian Service; at one time member of the state legislature and county coroner; aged 77; died, March 23, in a hospital at Spokane of heart disease.

Christopher James Patterson ✠ Hopewell Junction, N. Y. (licensed in New York in 1891); aged 78; formerly on the staff of the Hudson River State Hospital, Poughkeepsie, where he died, February 1, of arteriosclerosis and chronic myocarditis.

John Eagleton Ford, Grand Junction, Colo.; Kansas City (Mo.) Hahnemann Medical College, 1906; member of the Colorado State Medical Society; on the staff of St. Mary's Hospital; aged 74; died, January 20, of coronary thrombosis.

Irving David Steinhardt, New York; Columbia University College of Physicians and Surgeons, New York, 1906; aged 64; for many years on the staff of the Mount Sinai Hospital, where he died, February 25, of coronary occlusion.

Joe Bradford Wright ✠ Lynnville, Tenn.; Vanderbilt University School of Medicine, Nashville, 1912; past president of the Giles County Medical Society; served during World War I; aged 54; died, February 3, of coronary thrombosis.

Joseph Martin Knochel ✠ Lincoln, Ill.; Bennett Medical College, Chicago, 1915; served during World War I; formerly member of the city council; aged 53; died, March 21, in St. Mary's Hospital, St. Louis, of cerebral hemorrhage.

Bayley Burton Bachelder ✠ Sebastopol, Calif.; Hahnemann Medical College of the Pacific, San Francisco, 1914; on the staff of the Sonoma County Hospital, Santa Rosa; aged 63; died, February 23, of coronary thrombosis.

Mary Hance Eccles, Brooklyn; Woman's Medical College of the New York Infirmary for Women and Children, New York, 1878; aged 91; died, March 17, of arteriosclerosis, chronic myocarditis and coronary thrombosis.

Gertrude Dobson, Quincy, Mich.; Hering Medical College, Chicago, 1909; for many years health officer; formerly member of the school board; aged 81; died, March 5, of valvular heart disease and diabetes mellitus.

Fred Joseph Graham, Alma, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1891; member of the Michigan State Medical Society; aged 76; died, March 8, of coronary thrombosis.

John Colton Deal, Philadelphia; University of Pennsylvania Department of Medicine, Philadelphia, 1897; aged 65; died, March 12, in the Presbyterian Hospital of arteriosclerotic dissecting aneurysm of the aorta.

John Wesley Browning, Geary, Okla.; Barnes Medical College, St. Louis, 1899; member of the Oklahoma State Medical Association; aged 72; died, January 9, of cerebral hemorrhage and arteriosclerosis.

Lorenzo Oscar Smith, Harlan, Ky.; Hospital College of Medicine, Louisville, 1903; for many years mayor of Harlan; served during World War I; aged 63; died, February 11, of coronary thrombosis.

Glenn Moomau, Petersburg, W. Va.; College of Physicians and Surgeons, Baltimore, 1904; member of the West Virginia State Medical Association; aged 61; died recently of coronary occlusion.

John Howard Seiple ✠ Center Square, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1891; aged 73; died, February 13, in Miami, Fla., of cerebral embolism and hypertension.

Alva Garfield Dunbar ✠ Pulaski, N. Y.; University of Buffalo School of Medicine, 1912; served during World War I; aged 53; died, February 23, of diabetes mellitus and coronary thrombosis.

Guy Martin Russell ✠ Billings, Mont.; College of Physicians and Surgeons, Keokuk, Iowa, 1898; member of the National Gastroenterological Association; aged 70; died recently of encephalitis.

Max Wegman, Newark, N. J.; Long Island College Hospital, Brooklyn, 1909; served during World War I; aged 58; died, February 3, in Roseland of coronary thrombosis and arteriosclerosis.

Samuel Stern ✠ Atlantic City, N. J.; Jefferson Medical College of Philadelphia, 1905; served during World War I; aged 63; died, February 18, in the City Hospital of coronary occlusion.

Prentiss Leroy Hoot, Monterey, Ind.; Bennett College of Eclectic Medicine and Surgery, Chicago, 1890; aged 75; died, March 18, in St. Catherine's Hospital, East Chicago, of myocarditis.

Lovelace B. Capehart, Raleigh, N. C.; Leonard Medical School, Raleigh, 1907; Long Island College Hospital, Brooklyn, 1923; aged 78; died, March 8, in St. Agnes Hospital of heart disease.

Wilmer J. Sell, Crocker, Mo.; Central Medical College of St. Joseph, Mo., 1905; member of the Missouri State Medical Association; aged 74; died, February 2, of lobar pneumonia.

Frederick Patrick Reed, Stockton, Calif.; University Medical College of Kansas City, Mo., 1899; served during World War I; aged 71; died, February 7, of aortic insufficiency.

Anna Carville Hands, Boston; College of Physicians and Surgeons, Boston, 1894; Tufts College Medical School, Boston, 1895; aged 81; died, February 26, of coronary thrombosis.

James Marion Smith, Pocatello, Idaho; Iowa Medical College, Des Moines, 1886; Rush Medical College, Chicago, 1888; aged 84; died, February 15, of cerebral hemorrhage.

Elmer B. Grosvenor, Richmond, Ind.; Pulte Medical College, Cincinnati, 1882; formerly president of the board of health of Richmond; aged 80; died, March 12, of myocarditis.

Augustus Ives, Grand Ridge, Ill.; Bellevue Hospital Medical College, New York, 1878; aged 86; died, March 12, of acute dilatation of the heart and chronic pulmonary emphysema.

John Tavner Beale, Lovelock, Nev.; Missouri Medical College, St. Louis, 1876; formerly justice of the peace of Imlay; aged 89; died, February 28, of chronic myocarditis.

Thomas M. Eade, Champaign, Ill.; Rush Medical College, Chicago, 1894; aged 69; died, March 12, in the Burnham City Hospital of myocarditis and diabetes mellitus.

Edward M. Shaffner, Salamanca, N. Y.; University of Buffalo School of Medicine, 1884; aged 87; died, February 27, of bronchial asthma and edema of the lungs.

William Augustus K. Chase, St. Louis; Barnes Medical College, St. Louis, 1900; veteran of the Spanish-American War; aged 69; died, February 24, of heart disease.

Edith Harris Schad, Bellevue, Pa.; Woman's Medical College of Pennsylvania, Philadelphia, 1890; aged 77; died, February 2, of cardiovascular renal disease.

Henry M. Meyer, Jupiter, Fla.; Homeopathic Medical College of Missouri, St. Louis, 1888; aged 74; died, February 26, in Lake Worth of heart disease.

William Richter, New York; University of the City of New York Medical Department, New York, 1886; aged 77; died, February 2, of coronary sclerosis.

Lillie Dale Hanley Bates, Long Beach, Calif.; State University of Iowa College of Medicine, Iowa City, 1885; aged 84; died, February 6, of arteriosclerosis.

Norman Grady Williams, Franklin, N. C.; Emory University School of Medicine, Atlanta, Ga., 1917; aged 49; died, February 10, of cirrhosis of the liver.

William Henry Hersh, Chicago; Harvey Medical College, Chicago, 1902; also a dentist; aged 73; died, March 6, in the Cook County Hospital of pneumonia.

Wilfred Gilmour Reive, Welland, Ont., Canada; University of Toronto Faculty of Medicine, 1904; medical officer of health; aged 60; died, January 22.

Thomas H. Coke, Denver, Tenn.; University of Tennessee Medical Department, Nashville, 1901; aged 73; died, February 19, of hypertension and hemiplegia.

Lester A. Rhyne, Atlanta, Ga.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1890; aged 74; died, February 21, of chronic nephritis and uremia.

Harry Isaac Wiel, San Francisco; Johns Hopkins University School of Medicine, Baltimore, 1905; aged 61; died, February 14, of arteriosclerosis.

Josiah U. Johnston, Des Moines; Hahnemann Medical College and Hospital, Chicago, 1899; aged 70; died, February 24, of cirrhosis of the liver.

William Curtis Stifler ✠ Baltimore; College of Physicians and Surgeons, Baltimore, 1905; aged 69; died, February 17, of cerebral hemorrhage.

Morriss De Witt Kelley, Birmingham, Ala.; Louisville (Ky.) Medical College, 1904; aged 64; died in February of injuries received in a fall.

Eugie A. Ross, Dlo, Miss.; Memphis (Tenn.) Hospital Medical College, 1900; aged 64; died, February 27, in Jackson of esophageal varices.

Carl L. Prichard, Harold, Ky.; University of Louisville Medical Department, 1899; aged 71; died, February 21, of cerebral hemorrhage.

Charles Hiram Osincup, Colorado Springs, Colo.; Baltimore Medical College, 1891; aged 79; died recently of chronic myocardial disease.

William George Allen, Chicago; Hahnemann Medical College and Hospital, Chicago, 1910; aged 82; died, February 28, of myocarditis.

Dwight Gilbert Hoxie, Hampton, Iowa; Rush Medical College, Chicago, 1893; aged 81; died, February 17, of cerebral hemorrhage.

Albion James Howell ✠ Berkeley, Calif.; St. Louis University School of Medicine, 1923; aged 45; died recently in San Francisco.

Patrick H. Brown, Temple, Texas; University of Louisville (Ky.) Medical Department, 1892; aged 76; died, January 19.

James Walter Mulligan, Fort Coulonge, Que., Canada; McGill University Faculty of Medicine, Montreal, 1905; died recently.

George Elliott Chapman, Danville, Ga.; Louisville (Ky.) Medical College, 1886; aged 76; died, February 9, of heart disease.

Maca Gilbert Maker, Fall River, Mass.; Baltimore Medical College, 1909; aged 56; died, March 2, in Providence, R. I.

Allen Reed Taylor, Brodhead, Wis.; Milwaukee Medical College, 1899; aged 73; died, February 13, of coronary occlusion.

L. A. Weaver, Rogersville, Ala. (licensed in Alabama in 1888); formerly state senator; aged 82; died, February 15.

George Franklin Crawford, Tyro, Miss. (licensed in Mississippi in 1891); aged 73; died, February 5, of nephritis.

Jackson Rhodes, Burbank, Calif.; Medical College of Indiana, Indianapolis, 1897; aged 82; died February 12.

Ada Barker Luttril, Knoxville, Tenn.; Tennessee Medical College, Knoxville, 1907; aged 61; died, January 8.

Harry Edgar Cook, New York; Syracuse University College of Medicine, 1898; aged 65; died, January 10.

DIED IN MILITARY SERVICE

Joseph Antony Ciminera, Waterbury, Conn.; University of Vermont College of Medicine, Burlington, 1916; served during World War I; was called to active duty Feb. 24, 1941 in the National Guard as commanding officer of the medical detachment of the 102d Infantry, 43d Division, with rank of lieutenant colonel; aged 49; died, January 28, at Camp Blanding, Fla., of heart disease.

Bureau of Investigation

PREPOSTEROUS POPPYCOCK FROM HIEL EUGENE CRUM

The State of Indiana Catches Up with an Abrams Disciple

One of the strangest and most incredible stories to come to the attention of the Bureau of Investigation is found in the 199-page brief filed by the Indiana State Board of Medical Registration and Examination with the Supreme Court of Indiana, asking that court, in effect, to affirm the action of the Board in revoking the license of one Hiel Eugene Crum to practice chiropractic, naturopathy and electro-therapeutics in Indiana. This revocation was based on the charge of gross immorality in the conduct of his practice, because of the use of a bizarre machine. The story serves merely to illustrate that certain portions of the American public can still be fooled by the tenets of Albert Abrams, while others are sufficiently intelligent to recognize such fakery for what it is.

According to the brief, Crum received a certificate in naturopathy in June 1927. It shows that he graduated from the College of Drugless Physicians and that for his preliminary education he received his common school and high school training in Wilkinson, and that for his professional education he was a student in the College of Drugless Physicians from Sept. 14, 1925 to Sept. 14, 1926. The certificate of the dean, "Otis J. Briggs, N.D.," showed that Mr. Crum graduated with the degree of Doctor of Naturopathy from that school on Sept. 14, 1926, the same date on which, after a year in that school, he received two other doctorates referred to—Doctor of Chiropractic and Doctor of Electro Therapeutics.

While it would be very interesting to consider here all of the evidence presented in this case, it will be sufficient for our purposes to refer to portions of the testimony of a few witnesses whose names appear above the portions of their testimony presented herewith:

W. O. Hodge:

"After we began taking treatments of Crum the members of the staff of the City Hospital wanted her [the patient] to continue treatment at the City Hospital. I advised to let them do what they could and him too, but he advised not to go and I couldn't get her to go. She did go back and they wanted to give her X-ray treatments but she refused them because she was depending on Dr. Crum. He told her not to let them have anything more to do with it. He said he could cure her . . . Her health now is as bad as could be. She had a hemorrhage this morning. She has been in bed for six weeks. Part of her body has decayed and disappeared. You could see her ribs if it was cleaned out. I know. It was almost to her heart. We put pads on it to absorb the stuff in her breast. The other breast is as black as your hat. She is suffering from cancer, and was during the time Crum was treating her and said he could cure her and advising her not to go to a doctor. Part of the time she is out of her head so she cannot talk . . . He gave her different treatments but of the same sort. Sometimes he just rubbed the thumb nail."

Presumably thumbnail rubbing represents the ultimate in nature cure, since it is obvious that if anything is happening to the patient it is by virtue of nature alone.

Joseph B. Adler:

"Mr. Crum called off a number of different things while pushing his fingers on a little slide. I asked, 'What does this mean, doctor?' He says, 'When I call to the machine and push my fingers on the slide, if it has a rough feeling it indicates trouble; if it has a perfectly smooth feeling it does not.' After he had done that a good many times and he told me it was done by ether, I said, 'I feel no sensation of any kind. I don't see what connection there is. I am not connected with the machine.' He says, 'It is through the ether that you get the benefit.' I asked, 'What does this cost you?' He answered, '$300.00.'

"'Where was it made?'

"'In Chicago.'

"'How did you learn about it?'

"'Went to Chicago.'

"'How long did it take you to learn?'

"'Three months.'"

Carl Stone:

"About 1935 I had an attack of what the doctor said was kidney stones. I went to Crum and he worked for about fifteen minutes with his machine and he said I had better let one of the other doctors work on me, which was done. They didn't do any good. Finally they sent me to Dr. McAlpin [1] to use the machine. After Dr. McAlpin had worked with it about thirty minutes he said, 'That machine isn't any good at all. I will get you some medicine.' And he got me some morphine tablets . . . My son was supposed to have had absent treatments part of the time. When he treated me he would rub the pedal on the side and ask if I felt any better. I would tell him 'No,' and he would go through the same performance and ask me again, and I would tell him 'No.' If it was rheumatism for instance that he had in mind, he would say 'Rheumatism, rheumatism, rheumatism, rheumatism,' repeating it over and over in that same manner."

Like mumbo-jumbo from deep in the heart of Africa—and also some morphine tablets.

Toner Overly:

". . . He pulled the box over to him and started in a chant, using these words: 'Kill the bacillus, kill the bacillus, lymph to kidneys, lymph to kidneys, blood to kidneys, blood to kidneys, blood to intestines, blood to intestines, electricity to kidneys, electricity to kidneys, kill the bacillus, kill the bacillus poisoning,' and he did that for probably two minutes, and turned to me and says, 'Now the poison is killed. All we need to do is tone up your system and get rid of the other difficulties in your system and I think you will be all right. . . . He said I could come the next Saturday morning and in the meantime he would give me absent treatments on Monday, Tuesday, Wednesday and Friday."

Charles C. Shadley:

"On the second trip back I told Mr. Crum that I would like to know something about the machine, so he started explaining something about the ether and one thing and another . . . He told me about fertilizing a farm down by Martinsville. He never left the office at all to do it. He told me that he had fertilized the field with the machine and that it produced a good many more bushels per acre afterwards. He also told me about making a demonstration at a dental clinic where he said he filled some man's teeth with the machine so that in ten minutes you couldn't tell the tooth had ever had a cavity in it. Then he told me of some woman that worked in his office after she had been a patient. While she was a patient she made a remark to Mr. Crum about her husband having his finger cut off at the first joint. Says Crum, 'Bring him down and I will grow a new finger on that man.' She brought him. 'In ten minutes' time,' said Crum, 'that finger had grown out from the first joint there until it even had a new nail started on it.'"

Of course, all this is no more ridiculous than claiming to be able to diagnose and treat disease by the use of this machine, but it is in connection with subjects with which the public is somewhat more familiar and therefore not quite as successful.

In regard to a demonstration of finger-lengthening and shortening:

Scott W. Smith:

"I watched very carefully and noted that the lengthening of the finger and shortening of it was made by slanting the pencil . . . 'What are the colored lights for?' I asked. 'If you have one color light that may be kidney trouble. Another color would be some other ailment,' said he.

"'Doctor,' I continued, 'you didn't move the thing when you were diagnosing me.' 'Oh,' answered Crum, 'I must have forgotten that.' So he moved the dial along and obtained his original findings. . .

"He told me he could cure me of infantile paralysis. When I was ready to leave [after a "leg-lengthening" treatment] he said: 'Now if that should slip back you will have to come back for subsequent treatments.' I think he meant that when I got out on the street if I found one leg was still shorter than the other I should come back for further treatment. So far as I can tell the leg has never changed one bit."

Now **Hiel Eugene Crum** for himself:

"The school I attended was the College of Drugless Physicians, which also went by the name of Central Scientific College. It later came out in the papers that the institution was closed as a diploma mill. There was a lot that wasn't true about it, but I don't remember the instances. He was framed by the same outfit that is on me, and all he ever did that was wrong that I know of was to back date a diploma. I think he could still be going now. I went to his school regularly only from September 14th of one year to September of the next year. . . . I got the degrees of Doctor of Naturopathy, Doctor of Chiropractic, Doctor of Herbal Materia Medica and Doctor of Electro Therapeutics, all in one year. . . .

"I don't remember how long it takes to get a degree of Doctor of Herbal Materia Medica. Most of what I got was gotten by going over the stuff that they put out here over at Hammond in those herb books. There is a nerve place there where they sell herbs . . . the place has a good reputation among the drugless people. . . .

"In Briggs' school we studied electronics. I have a copy of a pamphlet he put out in 1924 that has got it in there, and it has got Psycho-Therapy in there, and Electro Therapy, and

1. For account of revocation of license to practice medicine in this connection, see J. A. M. A. **118**: 656 (Feb. 21) 1942.

Naturopathy, and Chiropractic and Electro-Therapeutics, and everything else. It has got Biochemistry." [From which one would judge that it was a fair size pamphlet.]

"I am the inventor of the box that is before me here marked Exhibit 7. I don't think I have used this identical box. I put a transformer in the ones I had. Then there are differences in the boxes. . . . Referring to the box marked Exhibit 8, I have used that box. There is a place in it to carry chemicals. The chemicals I use are Schusler's [Schuessler's?] Biochemical cell food. . . .

"The way I have reasoned the thing, it is in trituration. These chemicals are triturated trillions of times when I get them, and are triturated more after I get them, and it is a combination between them and whatever organic substance you want to work in with them, but that would make no difference. That is the whole thing. . . .

"The machine would diagnose without the chemical. It wouldn't be of no benefit that I can see without the chemical, from the treatment standpoint. The mixture helps in the diagnosis also; you don't have to have it though for the diagnosis, but it helps. . . .

"I have treated sarcoma and carcinoma. A sarcoma is a cancerous tumor. . . . I have treated all kinds of diseases that I know the names of, and a lot of them I don't know, I suppose. Wild Welch bacillus is just one of about five thousand foreign bacillus that gets in the colon. It is supposed to come from wild Welch rabbits."

"*Q.*—Isn't this wild Welch rabbit a dish they make up out of cheese and give it that name? It is not an animal at all, isn't that right?

"*A.*—Well, it got into this country through rabbits, is what I understood. It would not necessarily have had to have been wild. . . . I don't know whether wild Welch rabbit means any animal at all, or whether they speak of Welch rabbit as a dish made out of cheese and it was once called welch rarebit. I think I found about wild Welch bacillus in the dictionary. . . .

"I got my convictions on the formula I refer to in a dream. I got up one night after I had been thinking about what kind of chemicals I would like to have because I had awakened from a dream where I got the names of a chemical, so I got up and wrote down the list right away. But I did not altogether stick to the list of chemicals I got in a dream. . . .

"It is not necessary to talk into the machine, you can think into it.

"When I diagnosed the cancer I did not send any section of it to a laboratory to be studied. I diagnosed it by inspection, loss of weight, loss of appetite, general inefficiency, blood disease, blood findings. I guess that is the only way I ever diagnosed a cancer in any case. The only positive proof of the existence of a cancer is to take a section of the growth and examine it under the microscope. You can be sure in a great majority of cases whether they have cancer or not without a microscope. For tuberculosis cases I don't believe I ever had a sputum test made. . . .

"We know the death rate for all the germs. We have a death rate for tuberculosis which is 1,045. As to what that means—well, I have never tried to find the emanation rate—somebody brighter than myself does that—but I use the rates. . . .

"I did not get any information from Dr. Crile that he was using a machine like this. It came through one of his nurses who is an assistant of one of our doctors whom I know very well. . . .

"I don't know what these lights are for, and the holes, I never use them. The dial is supposed to measure the intensity of the emanations or the amount of disease they have. I don't know whether it is hooked up to anything on the inside. It may be just bolted on the inside and not hooked to anything. The machine doesn't have to be hooked up to a light socket to work. I can't tell you the purpose of a light in it. . . .

"The colors don't help in diagnosis, but when I am not able to get rid of the pain in any other way, I put it on blue or indigo and the pain leaves. Red gets rid of irritation. . . . For skin disease I put it on turquoise."

And so on, ad infinitum.

Even for quackery this is far beyond the beaten path. Time and time again when persons who are engaging in quackery and pseudo-medicine encounter the law, the same witnesses appear in their defense. Edward M. Perdue, whose name has been referred to in these pages in connection with his appearance as a witness for Norman Baker and in other connections, appears in this case. And he does himself proud. For example:

Edward M. Perdue:

"My profession depends on what I am engaged in. I am a lawyer, physician and engineer. . . . In therapeutics I am a graduate in osteopathy. I found when I concluded the publishing of some of my research I had discovered the cause and the biochemistry and the cure of cancer. . . .

"I have with me my own translation of works on emanations and oscillations, and I have it in Italian. My own translations have gone clear beyond anything done in the United States. . . .

"I did not have any desire to come here just to exploit my knowledge. They take me all over the United States because I am a lawyer, engineer and practicing physician. . . .

"The color ribbon has little holes in it, and above that are different rays, or colors of the solar spectrum, all the way from infra-red to ultraviolet.

"You can treat patients without putting any specimen like blood, urine or saliva in the machine. [Aha! An improvement on Abrams!—ED.] That is the justification for treating chickens and cattle. They have just as good a right to get well as we have. . . . Treatments can be given in the manner in which Dr. Crum treated the brother of a woman who was in his office while the brother was in Ohio. Three years ago my wife was seized with a very serious ailment. She broke out all over her body with a burning sensation. My wife corresponded with Dr. Madge Stephens, of Terre Haute, and by correspondence only and the absent treatment she got well. That helped to form my opinion as to whether or not it was proper to cure a person by absent treatment. . . .

"I don't know, for I have not investigated, whether this machine could assist in the fertilization of the ground or of the seeds in the ground to the extent that the crop would be more plentiful because of the treatment. The treatment by this machine of animals ought to be just as possible as in human beings. . . .

"I do not know the names of any graduates of the Kansas City College of Osteopathy who obtained a license within recent years. I can't give the names of any one who obtained a license in any state in the union upon a basis of reciprocity on the ground he had graduated from the Eclectic Medical University of Kansas City. I became a professor in the medical college five years before I graduated in the same medical college and went to school at the same time. I got the degrees of Bachelor of Science, Bachelor of Arts and Master of Arts from Kansas Normal College. I began going there in 1912, and I think I finished in 1923. No, the word should have been 18, that is 1823. But that was before I was born. No, I don't know the dates when I got the degrees. It is true I was teaching in the Hahnemann Medical School in 1895. I got the Master's Degree two or three years after I got my B.A. degree. I got that when I was 23 years old. I got my Master's Degree some time along in 1891 or 1892. I got a license to practice in 24 or 25, but I began practicing in 1900. It was lawful at that time to practice without a license. . . .

"I was a personal student of Dr. Albert Abrams. In this book entitled 'Writings and Translations of Dr. Edward M. Perdue' I have some work of Dr. John R. Brinkley. Dr. Brinkley went to school to me. He is the man whose radio

was closed in this country by the government. He was one of these fellows that cured people by the thousands by goat gland treatments. He had some rejuvenation thing by which this ionization to which I referred to could be stopped. He rejuvenated thousands of men and women. There were some articles published in the *Scientific American* about this Abrams to whom I have referred. I suppose he was investigated by the editors of *Hygeia*."

This is a reasonable supposition, in view of the fact that Brinkley unsuccessfully sued the American Medical Association and Dr. Morris Fishbein, editor, for a million dollars because *Hygeia* published a statement to the effect that Brinkley was a quack.

The foregoing excerpts come from the first thirty-six pages of this one hundred and ninety-nine page document, which merely represents the points raised in an appellee's answer brief. Conjecture, then, the total amount of evidence that would appear in the original suit. It hardly seems worth including the statement that on Nov. 3, 1941, the Supreme Court of Indiana upheld the action of the State Board of Medical Registration and Examination in revoking the drugless physician's license of Hiel E. Crum. (See also THE JOURNAL, Dec. 6, 1941, p. 1992, and Jan. 24, 1942, p. 322.)

SOME MISCELLANEOUS MEDICAL FRAUDS

A Variety of Schemes Debarred from the Mails

Fraud orders issued by the Post Office Department have frequently been the subject of extensive articles by the Bureau of Investigation in these pages of THE JOURNAL. Following are brief abstracts of some fraud orders not dealt with previously:

Joll C. Stockard.—This person was a bartender in a Los Angeles café and sometimes used the name Donald K. Eby. Through the Hollywood postoffice he sent out a nostrum known as "Formulae 300," representing that it would restore all users to a state of normal youthful vigor and vitality, and that it contained all the vitamins necessary to bring back those powers to all impotent men. Twice in 1941 the Post Office Department ordered Stockard to appear at a hearing and show cause why a fraud order should not be issued against him for making false and fraudulent representations and promises for his nostrum. When the hearing was finally held on July 30, 1941 Stockard did not appear. On this occasion, however, a government chemist and a medical expert testified for the Post Office. According to the chemist the preparation consisted of tablets each chiefly composed of alfalfa with 0.883 grain of sodium carbonate, 0.0015 [grain] of organically combined iodine, 0.064 grain of total alkaloids including those of lobelia, and traces of capsicum, sugar and talc. No yeast was found although the label on the bottle declared that each tablet contained 4 grains of live yeast. The expert medical witness discussed at this hearing the causes and scientific treatment of impotence and showed that Stockard's mixture did not contain all of the elements and vitamins necessary for the successful treatment of that condition and hence would not restore normal youthful vigor to impotent men. Accordingly Stockard was barred from the mails by a fraud order issued on Sept. 30, 1941 which also covered the numbers of the two postoffice boxes that he had used in Hollywood.

Terminal Products Company.—Under this trade style one Andrew Portnow of New York sold an elastic abdominal belt through the mails under representations which the Post Office Department declared to be false and fraudulent. Among these were that the device, when worn by any obese person, would, within a "few days," reduce the waist line of the wearer and remove all excess abdominal fat and would restore "pep" to any user and strengthen weakened abdominal muscles. The manufacturer denied these charges through his attorney. When the case came to a hearing it was shown that the belt in question was made of latex thread and that the part which encircled the abdomen was approximately eight inches in width and had what may be termed a two-way stretch. The pouch was of similar material but the understraps had only a vertical stretch. At the hearing expert medical witnesses testified for the government that obesity may be of two types, one of which involves glandular dysfunction and the other is the result of dietary indiscretions and lack of exercise. Thus every case of obesity should be studied and treated according to its causes. The witnesses went on to show that they had observed many cases of obese persons who wore belts similar to the one in question and in no instance was there noticed a weight reduction which could be in any way attributed to the wearing of the belt. In attempting to refute this evidence, Portnow presented two affidavits alleged to have been executed by regular practicing physicians in the city of New York. These stated that the writers had examined the belt and that in their opinion it would have a massaging effect on the abdomen which would tend to reduce local obesity, improve the posture and alleviate certain symptoms such as shortness of breath. This testimony, however, was discounted, since the persons quoted were not present to be cross examined, nor was it shown that either of them ever had treated obesity or actually used or observed the belt in question or one substantially similar thereto. On March 17, 1941 a fraud order was issued against the Terminal Products Company and its officers and agents.

Council on Medical Education and Hospitals

ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE

Thirty-Eighth Annual Meeting, Held in Chicago, Feb. 16 and 17, 1942

DR. RAY LYMAN WILBUR, Stanford University, Calif., Presiding

COUNCIL ON MEDICAL EDUCATION AND HOSPITALS

FEBRUARY 16—MORNING

Medical Care of Civilian Population During War

DR. RAY LYMAN WILBUR, Stanford University, Calif.: War, from the selection of the soldier down to his return to his home after war, compels the very best of medical service. Physicians who join the services are dislocated from their normal environment and they must learn new technics and new mass procedures in order to get properly done the large amount of medical work required. We need think only of the blood bank to realize what differences in procedure there are between now and the Spanish American War or even the first World War. The skills to be learned by the physician are more intricate, more precise and more effective than ever before. The call for good medical care is of primary importance. We must take it for granted as we build up a larger army and navy that there will be a heavy draft on members of the medical profession between the ages of 30 and 50. This compels us to face the question how we are to supply our civilian population with medical protection. Dependence on the physician and the quality of his work, particularly when the man of the household is in war service, is essential if we are to have a population that holds steady in the face of discouragement and even of disaster.

There is no easy way to multiply rapidly the number of well trained doctors and nurses. The training of the physician must be complete enough so that on graduation and at the end of the intern year he may face with assurance the most difficult medical problems. The greatest responsibility may come in his very first case following some emergency. We can shorten the number of calendar years involved by continuing his training during the so-called vacation period. There is no cheap and quick way to turn out first class physicians. This applies also for nurses. Our principal civilian problem will be to save the time of the trained physicians retained at home so that, in spite of reduced numbers, they can give satisfactory scientific care. There is real danger if we accept an inferior sort of medical attention. The various cultists, with their cheaper training, will not be used to any extent in meeting the emergencies of war. If we permit them to take over in any way the care of a considerable part of our civilian population we are going to pay a heavy price. Epidemics are a normal part of war. We have only to think of the encephalitis cases that distributed themselves over the world following the last war to sense what will come as we send soldiers and sailors over every sea and into jungles and swamps in many parts of the world. Only careful training makes it possible to make the early diagnoses, many of them based on chemical tests and the use of the microscope. If the symptom treaters are used to any great extent during war time we must expect disturbances of civilian morale. The cultist who manipulates an individual for his backache may not recognize it as one of the early symptoms of smallpox and is therefore apt to spread the disease. Ignorance is our greatest enemy in the care and protection of the human body.

If we are to meet the obligations that the community owes to citizens during war time, we must continue all those important social activities in which the physician has now taken an important part, such as the control of nutrition and the protection of the minds of our youth and of those who are under the strained conditions of warfare. Mere physical examination

does not give the clue to those innate and essential capacities of men on which we call to an unusual degree in war time. The standards of the draft boards are, of course, artificial and are the best screen for sorting out individuals that we have at the moment. None of these tests as yet give us a judgment on what I have designated as fitness. To maintain this capacity to do and to resist strains is the supreme task in the background in all our plans for medical care as a part of civilian defense. Those left at home must be kept fit and must possess that courage which comes with the glow of health.

In rearranging the medical care in any community after a severe draft of physicians from it, we must build on the medical institutions in existence or provide for new ones. We must extend the functions of all organized health departments. It is inevitable that there will be an extension of relief, which must be used wisely. Obstetric care must be given a primary place in all planning for the civilian population. Whatever is done must be in tune with experience over the centuries in the care of the sick by the medical profession. There will be an increased use of the hospital, and various forms of hospital care must be provided through hospital insurance or other ways. About each hospital there must be grouped the doctors and nurses of the community so that their time can be put to the greatest use. Clinical centers around groups of physicians will also be needed in some places. The indigent sick will require that care which they receive in normal times; but many of the facilities now used for the indigent sick will have to be used for those who normally would care for themselves in some other way.

New methods of convalescent care must be developed. Men returning from service, wounded or ill, should be given the best of attention. No doubt resort hotels can be used for this purpose. Convalescent patients and the chronically ill will have to be moved promptly out of the hospital centers so that the acute ailments can be handled. There will be a proportionate increase in the number of epileptic, incompetent and alcoholic persons in the peace time population. Every one should have hospital care available to him in every community. Doctors and nurses should be available at all hours. Patients are to be transported to doctors, and not doctors to patients. The California Physicians' Service, with its six thousand doctors, has indicated a procedure by which the medical profession can tackle these responsibilities of medical care. The Farm Security Administration, which is handling over one hundred thousand families and more than a half million persons, has shown what organized medicine can do in marginal rural areas. Experiments in Michigan and elsewhere show that medical care can be handled by and through the profession, if the will to do it is at hand.

While the leadership must come from the doctor, others must join in developing administrative mechanisms that will be sound and effective. There will have to be built up about each hospital a personnel that can be trained to substitute wherever possible for the laboratory workers, the nurse or the doctor. Many women will need to be brought into these auxiliaries to hospitals and, wherever it can be done, the nurse and the doctor should perform only those things that require the expert.

Many undesirables are left on the hands of the community in times of war. We shall not do a complete job unless adequate measures are taken to control the spread of venereal diseases, unless the forces back of the prostitute are brought under full control and unless the distribution of alcohol is put on a basis far different from that of the wholesale social abuse which is evident today. With terrific enemies abroad, we have at home termites that are boring into the foundations on which youth must depend. Wholesome living is required if we are to meet Spartan enemies capable of any sacrifice. A steady flow of well trained doctors and nurses must be maintained. We must see that premedical students are discovered, helped and educated in medical schools of high standards. The hospital can become such a center as it has never been before in educating the population in the scientific care of the human body and the scientific protections of society. The newer procedures of education made possible by the motion picture and the radio can be used to build up sound ideas of the human body that will help win the war. Each community must face its own health and other difficulties. Only through tens of thousands of well organized local communities, unafraid and willing, can we save our democracy in this war. Each community must stand on its own feet, organize its own facilities and provide its share of the common defense. To do this, medical care is requisite and must take promptly such new forms as conditions demand.

The Relationship of the Chemist to Medicine

VINCENT DU VIGNEAUD, PH.D., New York: The relation of the chemist to medicine is an involved question. All has not been well between the professional groups representing the chemist and the clinical man. The goal is to bring the groups representing chemistry and medicine to work together for the common good. We must think of the problem from the point of view of the field of medicine in its power to relieve suffering. The chemist has as real an obligation toward this end as the clinician himself, but in accomplishing this goal the chemist must function through the clinician and through the field of medicine. It is the obligation of medicine to use to the fullest extent what specialized technics the chemical discipline can offer and what the chemist can accomplish. At present the full power of chemistry and the chemist in medicine is not fully utilized.

The board of directors of the American Chemical Society became disturbed at the turn of events when chemists and clinical pathologists became involved over their prerogatives in the clinical laboratory. It foresaw that a wider gulf might develop between these fields which would be reflected in a retardation of the development of medicine and with a consequent injury to the public. I was charged by the chairman of the board of directors to select a committee to study this problem, to try to bring the American Chemical Society and the American Medical Association to work together and to make recommendations to the board of directors so that these ends might be accomplished. The committee became known as "The Committee on Chemical Service to Medicine." Chemistry as a profession is independent and of equal rank with other learned professions, but in this particular connection chemistry is functioning in a service capacity to the medical profession. Recognition of this by chemists is in reality a mark of strength and confidence and it does not detract from the standing of chemistry as an independent profession in its own sphere. It was felt best not to have any one on the committee who might be immediately affected by decisions of the committee. The members of the committee were Dr. Donald D. Van Slyke of the Rockefeller Institute for Medical Research, Prof. Hans T. Clarke of the Columbia University College of Physicians and Surgeons, Prof. Victor C. Myers of the Western Reserve University School of Medicine, Dr. Arnold E. Osterberg, head of clinical biochemistry of the Mayo Clinic and Dr. W. G. Karr of the University of Pennsylvania, consulting biochemist to the Abbington Memorial Hospital and the Philadelphia General Hospital.

One of the main issues at the outset of our study was the claim by some that the mere determination of a constituent of the body fluid or tissue was the practice of medicine. This is a fundamental point. It seemed to the committee that the determination of the constituents of the body tissues or fluids was not the practice of medicine, that one should be able to make a clear differentiation between technic and interpretation. We felt that the chemical analysis in itself cannot be regarded as the practice of medicine. It is chemistry—chemistry employed in the service of medicine. The actual interpretation of the result and application in diagnosis and treatment, however, was clearly the practice of medicine.

It was clearly seen that the chemist's responsibility began with the reception of the labeled sample for analysis and ended with his report of the factual data obtained from that analysis to the physician. To obtain the sample from the patient and to interpret the data for diagnosis, prognosis and treatment of an individual patient are definitely the function and responsibility of the medical profession and should in no way be assumed by the chemist. A chemist may collect a sample from a patient only on direct authorization of the physician. The chemist must not attempt to interpret the data in their direct application to the patient. The character of the information

which the clinical biochemist may offer to the physician from his knowledge of the voluminous literature of clinical chemistry should always be abstract, a combination of a perusal of the literature integrated with basic biochemical information. It thus should always be informative but never specifically diagnostic. Our committee feels that a chemist must respect this in his relation with the medical profession and should never transgress this line. However, the chemical profession should be encouraged to assume the responsibility for the standards of the actual chemical work done in the clinical laboratory.

Another basic point which the committee felt must be established was that no barrier should be set up between the clinical biochemist and the clinician. The chemist recognizes the service which a clinical pathologist can render as consultant when needed, but the chemist feels that the clinical pathologist's role as an intermediary must not be an obligatory part of a system of regular clinical practice but rather that he should be a consultant called in only at the discretion of the physician in charge of the patient. The patient should not be required to pay for the services of a clinical pathologist if the attending physician who has requested the analytic data feels capable of making the diagnostic interpretation himself from the data. The chemist feels that there should be no restriction placed on a competent clinical biochemist in his function of accepting material from and reporting the factual data directly to the practicing physician. Where such restrictions have already been imposed, we would urge the medical profession for the good of medicine to try to have these restrictions removed and take advantage directly and fully of chemical aid. Of course, if the chemical profession demands these rights, it has an obligation to the medical profession and to the public to see to it that the chemical work is of high quality. Furthermore, the chemical profession must see that chemists do not usurp privileges and duties of the medical profession. A dangerous situation can arise if the patient can go directly to a chemist for analytic data to be used in self diagnosis.

If the medical and chemical professions can join in an effort to improve standards of clinical chemical laboratory work, the American Chemical Society is prepared to work out a system of certification for clinical biochemists, i. e. chemists who devote the major part of their time to the application of chemistry to the service of clinical medicine. Certification will undoubtedly aid in elevating the profession of clinical biochemistry and set a standard of service to the medical profession. Certification must rest on competence and training. The committee is prepared to recommend to the board of directors of the American Chemical Society that a biochemist with a Ph.D. degree or its equivalent with at least an additional year's training in a hospital laboratory would qualify as a clinical biochemist. The exact statement of the qualifications is open to further deliberation. It might be necessary in addition to have certification in another classification of a group with less training. These might be college graduates with a background of organic, physical, qualitative and quantitative analytic chemistry. They ought to have at least one year of training in a clinical laboratory under the direction of a clinical biochemist whose training I have outlined. It would be preferable not to call these individuals technicians but to call them assistant clinical biochemists.

There is a third problem, whether, in a clinical laboratory where other work in addition to chemical work is done, a clinical biochemist judged of qualified scientific and administrative caliber might become the director. Our committee feels that a question of directorship should rest on competence and not a particular degree or on what subject is represented. A director may have under him men engaged in work in which he himself is not versed, but he may have the ability nevertheless to judge quality and thoroughness and accuracy of work. We believe that a clinical biochemist who through years of contact has learned to appreciate the problems involved in a clinical laboratory and who has the necessary administrative ability which would fit him for a director of a laboratory should be eligible for the directorship. The number of cases in practice would perhaps be relatively few. Yet it is an important point in principle. If the medical world offers nothing but secondary positions it will get nothing but secondary chemists, except in unusual cases resulting from fortuitous circumstances. The committee has been busy for two years quietly working to effect a satisfactory solution of these questions.

A still greater problem is the full utilization of the chemist in clinical investigation. Medicine should encourage competent chemists with initiative, originality and ability, albeit without a medical background, to participate in clinical investigations with proper clinical collaboration. It is extremely difficult for one man in these days to bridge the gap between medicine and chemistry in an attempt to apply both disciplines to the study of disease. There are individual clinicians capable of doing this and such men are indeed desirable, but we must have more instances of the chemist with the intensive training in chemistry meeting with the clinical man in frank collaboration. An intellectual attitude which properly evaluates the position of medicine as well as chemistry is needed before complete understanding and harmony can be achieved. Each field of science has its own methods. Nevertheless, each field receives help from the more advanced and exact fields. The physicist looks toward the mathematician for aid, the chemist toward the physicist and so on. The medical man must look toward other fields for guidance in development of new concepts and methods and must, on the other hand, pass on the fruits of his endeavor to other fields. When such a mental attitude of mutual respect and intellectual humility is accepted by workers in interrelated fields, then true harmony will prevail.

Professional Education

Rufus C. Harris, LL.D., New Orleans: The chief role of the professional man in earlier times was that of stabilizing custom and of serving the past. His modern counterpart today is bound more closely to the moving front edge of man's current experience. Education for a profession suggests methods by which a person studies one course of life and action, acquiring cumulative knowledge of meaning, values and data the understanding of which is essential to individual progress and intelligent living. Such study enlarges experience, which is educative to the degree that it rests on a continuity of a significant knowledge, and to the degree that this knowledge modifies the learner's outlook, attitude and skill. It must have longitudinal and lateral dimensions. It must be historical and social, orderly and dynamic. As successive generations faced the task of getting the world's work done, many things have been found requiring special skills. As the structure of society became more intricate and the technology which it employed more elaborate, natural aptitude for special tasks, and self training by the trial and error method, were not enough to supply the requisite degree of skill in the necessary number of persons. Professional and trade schools have come into being by the choosing of a few of each generation to devote all their time to imparting the requisite skill to the generation following.

The problems of professional education are thrown into a practical perspective by grouping them under the two great aims of all such training. One aim is to impart to the coming generation of practitioners the existing fund of professional knowledge and skill in an effective way. The other aim is to renew the fund of knowledge to be imparted by adding to it the new that makes for greater professional skill and by sloughing off what has lost its utility. As to the aim first mentioned, it is the teacher's place to stand between successive generations of men and pass to the coming generation that body of professional knowledge and skill which made the passing generation in that profession most useful in doing the work of the whole social group. Coming to the other aim, namely the improvement of the fund of professional skill which must be handed on from generation to generation, the most striking fact is that in the art of the practitioner of any profession, change, though slow, is constant. Modes of thought shift, population changes, customs and manners drift, domestic life is altered, business relations take new forms, and political questions present new shapes. The practice of the professions is conditioned by this general flux. There is always present, therefore, the problem of renewing the fund of professional skill which is to be handed on by adding the new and discarding the useless. As changes eat into the fringes of professional knowledge its center gradually shifts, and the fund of learning which we are to transmit must also shift if maximum professional ability is the constant object of professional educa-

tion. It is from this standpoint, if any, that a vital relation appears between productive scholarship in medicine and medical education. Knowing what of the old to discard and finding the new to add requires confident, thorough scholarship, on a comprehensive scale, if the lag between the changes in training and those in practice is not to become so great as to be seriously wasteful.

The major load of renewing our fund of professional skill must be shouldered by the professional schools. Just as our university science departments, in addition to teaching students, have borne the major load of scientific research, so the work of the university professional schools must be organized in order that the schools may carry a larger part of the research so necessary for professional education. The difficulty is that the teaching and other loads of these preceptors is so heavy that seldom can they, unless they have exceptional mental ability and physical strength, do more than occasional pieces of semithorough research without paying in loss of health. One of the outstanding and challenging facts in the history of professional education since it was undertaken by our universities has been the adherence to a policy of giving such teachers instructional loads which exhaust substantially all their time and strength. This policy is a tradition of the earlier period of professional apprenticeship. It puts almost the whole emphasis on merely teaching what the passing generation knows. Back of it is an assumption which ignores the task of adding to our fund of knowledge as one of the chief functions of professional education. A proper possession then of what may be called a vision of research in professional education constitutes professional education's greatest opportunity and most vital need. Means must be found in our university professional schools for giving to those who teach the necessary time in which to do it. Moreover, some of the undergraduate students can do worthwhile work. Such students are growing in numbers. This is probably the most hopeful development in professional education today. More and more of them are persons capable of making valuable contributions to our fund of knowledge, and one of the most important questions with which any professional faculty can busy itself is to determine how further to increase the number and quality of such students and how to make their work of maximum value.

The line which divides the trade school and the professional school may become in these times of crises dangerously vague and indistinct, but the differences in attitude and purpose must be significant. I do not believe that we must sacrifice education to win the war. It is one of our most important objects of the war. It is one of our best defenses. If the stream of our civilization is not to become dried up at its source, the professional schools must treasure and convey the wisdom of the past to the coming generations, who may thereby have an orderly understanding of life as an environment in which to find personal happiness as well as material success. To do so they must hold in their ranks and put to better use those minds which are capable of discovering, reorganizing and assaying the trends and aims in nature and in human society. The chief task is that of advancing science and history. No claim is made that an entire science, university or department of a university should be placed behind an effort to effect any given single change in the economic or political structure of our culture. Hypotheses are an indispensable part of good teaching and research. A good scientist has a point of view. He holds it subject to constant correction, but without a point of view he is no scientist and as a teacher he becomes simply a walking equivalent of a second rate encyclopedia or a colorless textbook. A prevalent protest of alert students is that the immediacies of facts and data tend to operate in the university classroom as a monopolizing concern, shutting off the listener from the ripe wisdom of the mature teacher. It is the boast of some professors that they handle controversial subjects in the classroom in such a skilful manner that the students are never able to know what the professor himself really thinks about the problem. This amounts to sabotaging the inner meaning of education. No university, of course, should have a staff all the members of which think alike on a given problem. But the blurring of explicit statement of sharp and divergent hypotheses within a faculty is almost as dangerous. There have been handed down to this generation few institutions more precious than the universities with their schools for professional education whose abounding vitalities are attested by their extraordinary longevity, a fact which is in its turn witness to their success in satisfying many of the noblest and most insistent of human desires. Only an utterly phlegmatic imagination could fail to sense the power of such institutions of our day to serve as no other agency can serve a way of life which needs the refining and spiritualizing forces which lie at their command.

A prevalent mood today is a sense of helplessness in the face of the too bigness of the issues we confront. This is no new experience for human beings, however wistfully we may regard the quiet continuities of earlier periods. Prof. J. B. Shotwell a short time ago characterized "the anarchy we are living in today" as "the most dangerous since the fall of Rome." Ours is a world of division of labor and specialization. Each of us works, whether as scientist or business man, on a narrow sector. This itself enhances our sense of helplessness, because whatever we do we feel ultimately coerced by larger forces not controllable within our immediate area of personal concentration. Herein lies one source of the sense of ultimate futility that haunts our private worlds. The point which all this suggests is the bringing over into professional training more of liberal arts tradition. The complexities of modern living require of the physician or surgeon broader educational bases and experiences and wider social awareness than former periods permitted. An appraisal of modern man leads to rather desolate and shapeless confusion unless one is able to perceive the general pattern which the process of living is taking. The profession whose members are able to balance comprehensive perspective with methodical analysis of detail, who are able to serve and promote the effort to establish the long view out of objective consideration of the forces which affect life in our day, will find its place secure in whatever may be prescribed for existence in an uncertain world.

The War, the Colleges and Federal Aid

WILLIAM B. MUNRO, PH.D., Pasadena, Calif.: This article appeared in full in THE JOURNAL, March 28, page 1030.

The Effect of the War on Medical Education in Canada

DR. JONATHAN C. MEAKINS, Montreal: It is hard for me to shed the cynicism produced by the ten years that my country has been at war in the forty years of my adult life. War cut across my college days, then the years of my early manhood, and now in the twilight years of my academic life I am thrown back again into war—war of a savagery compared to which the campaigns of the great Mongols pale into insignificance. This same comparison has influenced our students as nothing else could do. Its influence goes back even to the high school.

In 1914-1918 the army was the dominant service in our country. To these forces went the man of mature years and strength. There have arisen with us since those days the navy and the air force, which have rivaled the domination of the army and have appealed to our youth with an almost overwhelming urge. In 1939 we had little of either. Today the destroyer, torpedo boat and corvette are manned by youths. The fighter, power diver, reconnaissance and bomber planes are the realm of the young. These are all of their generation.

I can speak only of my own college, which is representative of the young people of this continent. The unanimity of their beliefs and ideals is surprising. This did not originate during their medical course alone but antedated it. The adventurous student, to whom the practice of medicine seemed to offer more action than did other professions, turned his eyes toward greater and more immediate adventure. This was an unconscious act inspired by those ideals and angers. The number of queries received from young men who have contemplated a medical career and the searchings of heart of freshmen and sophomores as to whether their duty does not lie with the combatant forces leaves little doubt that these ideals have shaped and will shape the destinies of many who would otherwise be leaders in our profession. I do not imply that the

standard of medical students is any lower than before the war but that a certain element with the capacity of leadership may have been reduced.

In May, last year, it was rumored in the press that the Canadian forces would soon be in need of many additional medical officers. To date no authoritative statement has been made to this effect. A poll of our first three years was answered by 81 per cent, and all but three, including the women, pledged themselves to join the armed forces at the completion of their medical training. Such a deep feeling of national obligation cannot help but breed and foster an unrest which is not conducive to concentration toward the acquisition of knowledge for such an exacting profession. This distraction has been increased by requiring the preclinical students to fulfil one hundred and ten hours of basic military training during the academic session. This represents six hours drill a week for eighteen weeks. All these factors have had an influence on the students.

What measures have been taken in Canada to produce more medical graduates? Increased production can be accomplished only by enlarging our classes. By this means in 1946 the first increase will be harvested. This, many will say, will be too late. The alternative is to force our present crop to maturity at an earlier date by running four terms a calendar year for three years instead of three terms for four years. Can a medical course be compared to an assembly line which is limited in the last analysis by the speed at which a man can screw tight a nut to its bolt? Can the human brain be so geared? I doubt it. There are other considerations. Certain courses in the curriculum can best be given at certain times of the year. Have we in Canada a dire necessity for an increased number of doctors and if so how far will one additional graduating class relieve this demand? It has been estimated that 30 per cent of our profession could be withdrawn from civilian life for the armed forces if they were implemented with any degree of uniformity. There are about eleven thousand practicing doctors in Canada; 30 per cent would represent three thousand three hundred available for active service. In Canada there are about four hundred and fifty graduates a year, of whom about four hundred are physically fit males. If before 1945 we graduate one additional class—and that is all we can do by acceleration—this would at most be enough for an additional sixty thousand troops in the different services. But this maximum would have to be implemented by compulsory selective service, which at present is not the law of our country.

These problems have agitated medical education in Canada. The curriculums of the nine medical colleges do not follow a common pattern. Each has its own individuality. McGill decided in 1936 to lengthen the session to thirty-six weeks, exclusive of examinations, from thirty weeks per session; consequently in 1940 we graduated two classes. Our session now runs practically from Labor Day to the third week in June. Other medical schools can do the same without disrupting their excellence of instruction.

There comes the question of the teaching staff. The full time staffs of anatomy, physiology, biochemistry and pharmacology are not as a rule much disturbed by present conditions. The part time teachers have, however, been sadly depleted in the departments of pathology and bacteriology, and particularly in the clinical subjects. The last are hard pressed from three directions. On the average the staffs of all the teaching hospitals of medical schools have suffered or will suffer depletion to a dangerous extent. This is not a static condition but will progress irregularly as time passes. This has placed to an increasing degree an additional burden on the older members of the hospital staff in matters of private practice, hospital duties and additional teaching hours. They differ, therefore, from the general run of practitioners who have but an increased private practice to consider. The vagaries of this depletion bring queer results. It might be expected that general practitioners, internists, surgeons, orthopedists, roentgenologists and pathologists would have enlisted, but the wholesale enlistment of obstetricians and gynecologists leaves one aghast, particularly as they seem to have a passion for the navy.

And so it goes in an ascending spiral of endeavor and sacrifice, which, however, must not be allowed to plunge medical education into a vicious circle of overworked students and teaching weary staff. If acceleration is the solution, then let us slough off the frills but hold fast to first principles, so that our teaching will be well and truly done, and let us see to it that the medical students, the public and the men in arms will not upbraid us for being faithless to our trust.

February 16—Afternoon

Current Medical Personnel Problems of the Army

Col. George F. Lull, M. C., U. S. Army, Washington, D. C.: The following will give an idea of what officer personnel is required for the Medical Department for the year 1942: Medical Corps 23,658 (this figure includes personnel for professional units for theater of operations for 1942 augmentation only), Dental Corps 5,309, Veterinary Corps 1,015, Sanitary Corps 498, Medical Administrative Corps 2,310. At present there are on duty in the Medical Corps 11,790, Dental Corps 3,306, Veterinary Corps 731, Sanitary Corps 235, Medical Administrative Corps 1,478. The majority of these officers are reserve officers on extended active duty. The question arises as to where these officers are to be obtained. With five thousand graduates each year, there should be at least three thousand qualified for military duty. If the average age is 26, then in the age group 27 to 36 there should be thirty thousand available.

All requests for commissions should be addressed to the Procurement and Assignment Service. Medical students of the third and fourth year classes are allowed to apply for commissions in the Medical Administrative Corps and, when commissioned, will not be called until they have completed a one year internship. The Surgeon General has recommended that this privilege be extended to the members of the first and second year classes and to all bona fide matriculants.

When a man becomes an army officer, he enters a new profession. Line officers, in 90 per cent of instances, take up new careers, entirely different from their civil occupations. There are many assignments which have to be filled by medical officers and which are dissimilar from the duties performed by them in civil life. Infantry regiments have eight medical officers in many instances. Unless the senior officer trains his men, he will have dissatisfaction now and will fall down in combat. It is highly important to train medical officers and men with tactical units prior to combat, as the prompt treatment and early evacuation of the wounded are the greatest factors in the conservation of manpower. We have had one of the lowest sick records in history.

Two years ago the Secretary of War authorized the formation of hospital units which would be called out in case of war. These units consisted of general hospitals, evacuation hospitals and surgical hospitals. They were sponsored by civil hospitals and medical colleges. Some of these units have already been called out and are en route to distant points. With the ranks of American medicine so greatly improved since the last war, I can see no reason why we cannot commission the number required from volunteers. It would be a reflection on us if we had to resort to legislative action. When the armistice was signed in 1918 there were about thirty-one thousand doctors in the army, and I am sure that we are going to repeat our performance in this war.

Medical Education from the Standpoint of the Navy Medical Corps

Rear Admiral Ross T. McIntire, M. C., U. S. Navy, Washington, D. C.: The navy has a great stake in medical education in this country. The Bureau of Medicine and Surgery has presented a plan to the Secretary of the Navy, which he has approved. It is now possible for those premedical students who have been accepted for entrance and all medical students in accredited medical colleges to be appointed in the United States Naval Reserve in class H-V(P), provided they meet the physical and other requirements. Such students would not be nominated for active duty until after they have completed their prescribed medical studies and shall have been accepted as acting assistant surgeons of the navy for intern training or have served one year's internship in a civilian hospital accredited for intern training.

It is my belief that a routine college course, as such, is of doubtful value to the future of a doctor. True, it does lay down groundwork for cultural education and consequent broadening as the young man goes on in life. Let us now consider the age factor. The average boy graduates from high school at 18, spends four years in college, four years in medicine and one to two years in internship and is then 27 or 28 years of age. During this time he has had to secure from $700 to $1,000 a year to finance his education. Too often the applicants for entrance to medical college do not come from the right sections of our American life. Too many select medicine because it is a respected profession and seems to be a way to make an easy livelihood. It is a business to some and not a profession. We should be extremely careful in selecting students to see that this type does not get into medical school. I should like to present the thought of standardizing premedical education so that at any accredited medical college the academic and medical courses could be completed in six years. This would bring the medical student into a position where he could practice medicine at the age of 26. It would mean much to the navy, as we are now getting officers who are a year or so older than their line running mates. We have a plan whereby all reserve officers are given proper rank as far as age is concerned. When officers and men live on board ship in close contact, to have a man years senior in age and junior rank to those above him is never good.

I should like to see greater emphasis on instruction in preventive medicine. The army and the navy are being importuned by other organizations, such as the National Osteopathic Association, for permission for graduates of their schools to take examinations for entrance into the Medical Corps. One main objection that we have presented to them, after inspection of one of their best schools, is that they do not approach disease from the preventive standpoint. All our schools could improve their teaching in the field of preventive medicine.

In every accredited school we should have a department of tropical diseases. Tropical diseases are appearing in every section of the United States. Industrial hygiene should be taught in every one of our schools. I should like to see military and naval medicine have a more prominent place in the curriculum of all our institutions.

It is our considered thought that every man in this country should at some time give one year of his life to his government. This applies definitely to the boy who is going to study medicine. When a boy reaches let us say 18 he should be called on to decide as to when he would care to give this year of service, having to do this before he is 28. I leave this thought with you. It would be a splendid morale-building method and would do untold good to the nation and to the individual.

The Navy Medical Corps does not encourage specialization until the medical officer has had an opportunity to become well grounded in medicine and surgery. We have found, on numerous occasions, that young men coming into the service who have had nothing but special residency courses following graduation and internship, covering a period of from three to five years, when sent on independent duty, turned out to be poor doctors. Had these boys been given an opportunity to see a lot of patients in general practice they would be better surgeons, better pathologists today.

The need for young doctors in the Medical Corps of the Navy will average three hundred each year. This will hold good for the next five years. We base our needs on a ratio of 6.5 doctors for every thousand of personnel. At the present time we have on duty some thirty-one hundred medical officers. Great numbers must not be taken into the regular service at any one time, unless forced by abnormal conditions. The Navy, however, can assist in training interns far beyond its own normal needs and will be glad to do so. It will be necessary in my opinion for the medical schools to double their output during the coming five years. I believe, however, that the courses now given should not be curtailed in any way, as it is extremely necessary that graduates be well grounded. In the field of aviation medicine it is our experience that the average medical officer has not had enough mathematical background to be able to carry on the research that we find necessary in the study of the atmosphere. Unless the doctor is able to direct and evaluate the studies in atmospheric hygiene, much time is lost and the practical side of aviation suffers. We should give undergraduates a good understanding of what aviation medicine amounts to but make them understand that it should not be specialized in until a thorough groundwork has been laid down by them in general medical and surgical principles. The Medical Department of the Navy is extremely grateful to the medical profession for the continued help that is being given, and in return the Navy wishes to do all it can to help in your problems.

Wartime Problems of the Public Health Service

SURG. GEN. THOMAS PARRAN, U. S. Public Health Service, Washington, D. C.: This article appeared in full in THE JOURNAL, March 28, page 1033.

Selective Service and Medical Students

COL. LEONARD G. ROWNTREE, M. C., U. S. Army, Washington, D. C.: The function of Selective Service is the procurement of man power for the Army. Selective Service has always been sympathetic to your needs. In my early days in Washington we had many conferences on what to do with medical students. It was the general feeling that this problem could best be solved by taking medical students into the Army and Navy reserve corps. The crucial steps in the program were as follows: First, General Hershey defined clearly the responsibilities of the local boards and indicated their authority in the matter. Next pertinent statistics were collected from the American Medical Association, the Army, the Navy and the United States Public Health Service concerning the need for doctors. These figures seemed to carry no weight at first, but there soon appeared an inspired statement from the Office of Production Management on March 4 of last year to the effect that there existed an overall shortage of doctors and that the supply of medical students not only should be maintained but should be encouraged to grow. On May 2 General Hershey's memorandum to all state directors indicated that "there are no replacements for medical students who are withdrawn from school." To this point the American Medical Association and Selective Service carried the ball. Dr. Rappleye reports that of the twenty-two thousand medical students handled by Selective Service there were only three with just causes for complaint. This really constitutes a goal. The Navy created the ensign reserve, which took care of third and fourth year medical students and first year interns. Later this opportunity of applying for a commission with the Navy was extended to all medical students. The privilege was extended of commission to all as Ensigns HV(P), United States Naval Reserve. The Army opened up its Medical Administrative Corps for the commissioning of third and fourth year students and first year interns.

When I left Washington the situation was as follows: Bona fide premedical first and second year medical students were being deferred by Selective Service. Students were advised to apply for commissions in the Ensign Reserve of the Navy, and third and fourth year students and interns to apply to the medical administrative corps of the Army for commission. Second year residents were left to their institutions for certification as to essentiality.

The need is for an all out effort. Colonel Lull has just informed us that the need for officer personnel for the Army Medical Corps for this year is 23,658. He explained that the medical corps figure includes personnel for professional units for theater of operations for 1942 augmentation only. During the last war we had 3,673,888 men under arms and some 30,591 officers in the Medical Corps of the Army.

A communication from the War Department dated February 11 has just come to hand stating that the privilege of applying for commissions in the Medical Administrative Corps is to be extended to first and second year medical students and bona fide accepted matriculants at approved medical schools within the United States. May I, representing Selective Service, after a year's cooperation with you and with the American Medical Association, venture to suggest that: 1. The present committee, Drs. Rappleye, Burwell, Diehl and William Pepper, continue to work closely with the Army and the Navy as they have in the past with Selective Service. This committee was appointed by the Association of Medical Colleges. It has proved its worth. 2. Let the Army and the Navy carry the ball for

you. 3. Adhere strictly to cooperation. Keep the Army and Navy playing as at present, both intent on carrying the ball in the same direction.

The Committee on Medical Preparedness of the American Medical Association

DR. IRVIN ABELL, Louisville, Ky.: The Committee on Medical Preparedness of the American Medical Association came into being in June 1940, at which time the Surgeon Generals of the Army, Navy and Public Health Service requested the American Medical Association to undertake a survey of the medical personnel of this country, with particular reference to its qualifications and availability. The committee is made up of the general chairman, a chairman for each of the nine corps areas in the country, the President of the American Medical Association, the Chairman of its Board of Trustees, the Secretary of the Association and the Editor of THE JOURNAL.

The objectives of the survey were to determine (1) the number of physicians licensed to practice medicine, (2) the number capacitated for active service and those incapacitated for active service, (3) the number and location of physicians who may be qualified and available for the armed forces and for other essential services in case of national emergency, (4) the number available for service to civilian population under emergency conditions, (5) the availability and qualifications of those who can serve in special fields of medicine and (6) the number and identity of physicians qualified for teaching and research and who are essential to maintenance of educational institutions, and the number, age, qualifications, availability and other characteristics of all members of the medical profession essential in order that the total personnel resources can be utilized in intelligent preparation, appropriate assignment and adequate services for the armed forces, expanding industry and civilian population.

Mailing of schedules began within less than one month after the creation of the committee, July 5, and was completed on July 6, 1940. In this first mailing 179,976 schedules were sent to the latest known addresses of physicians licensed to practice medicine. Subsequent to July 16, 1940 approximately 6,000 were sent to recently licensed physicians and to those who for other reasons were not included in the primary list.

Of the total of about 185,800 physicians who received schedules, slightly more than 158,000, or 85.8 per cent, had returned them on Jan. 2, 1942. Adjustment of totals for death and duplicates give a total list of about 184,000. The information contained in these schedules is transferred to punch cards. To complete the punch card file for all physicians, some 26,000 schedules were prepared for those who failed to make a return, these being prepared in the state medical associations and county societies. These are designated as incomplete, since they do not include answers to all schedule questions. On Jan. 30, 1942 all original and incomplete schedules had been edited, coded and punched. These 184,000 schedules and punch cards constitute the live working file of physicians in the United States and the dependencies. The compilation of this census is a continuing process, since new schedules from recently graduated physicians are being constantly added and others for deceased physicians are being daily withdrawn. A large amount of clerical work is involved in changes of addresses and in properly listing the names of physicians ordered to active duty with the armed forces and of those who have been relieved from duty. Time consuming investigation and an important phase of the census pertains to the confidential investigation of professional qualifications. This has been largely done by the various committees of the Medical Research Council and by the certifying boards. This has been completed for approximately 135,000 physicians. Listing sheets are in the course of preparation for the remaining 49,000.

The number of physicians under 45, the highest age level of the Selective Service Act, is about 62,000. Out of 134,771 schedules studied from this point of view, 41.1 per cent of the physicians classified themselves as general practitioners, 24 per cent as full time specialists and 34.5 per cent as part time specialists. If we classify the part time specialists as general practitioners we have about 100,000 general practitioners and 33,000 specialists.

The Subcommittee of Medical Education of the Health and Medical Committee recommended the establishment of an agency for the procurement of physicians for the armed forces, industry and the civilian population. This recommendation was referred by the Health and Medical Committee to the Committee on Medical Preparedness, which at Cleveland presented to the House of Delegates a resolution relative to the establishment of a procurement and assignment agency. The resolution was unanimously adopted by the House of Delegates and was presented to the Health and Medical Committee on July 2, 1941. The Committee on Medical Preparedness met in Washington on August 19 and 20 to consider this resolution, in conjunction with representatives of various federal agencies. On Sept. 3, 1941 the President established the Office of Defense Health and Welfare Service with Mr. Paul V. McNutt as director. The Health and Medical Committee was transferred to this office. The resolution relative to the establishment of the Procurement and Assignment Service was referred to the Health and Medical Committee, which on October 22 met to initiate the development of this service. An agreement on policy was reached and a commission appointed with the Health and Medical Committee to draft a program for its Procurement and Assignment Service, the members of this committee being Frank Lahey, Sidney Burwell, Clarence Selby, Morris Fishbein and Willard Camalier, the latter representing the dental profession. This commission met on October 28 and submitted its report to Director McNutt, who in turn transmitted it to the President, with the result that the Procurement and Assignment Service was established on October 30 as one of the subdivisions of the Office of Defense Health and Welfare Service, with the following membership: Dr. Frank H. Lahey, chairman; Dr. Willard Camalier, past president of the American Dental Association, representing the dentists, Dr. Harold S. Diehl, University of Minnesota, representing medical education; Dr. James Paullin and Dr. Harvey Stone representing the medical and the surgical civilian profession, and Dr. Sam F. Seeley, connected with the Surgeon General's Office, who was relieved from active duty therein and assigned by General Magee to the agency as its executive officer.

The Health and Medical Committee and the Procurement and Assignment Service are both subdivisions of the Office of Defense Health and Welfare Service. They occupy adjoining offices and are closely linked in that the Subcommittees on Dentistry, Hospitals, Industrial Health and Medicine, Medical Education and Negro Health are practically the same. The personnel of those committees are identical. On December 18, at a meeting of the Board of Procurement and Assignment Service with the Committees on Medical Preparedness of the American Medical Association, the American Dental Association and the American Veterinary Medical Association, a definite organization was completed for the functions of this service in relationship to the needs of the professional personnel. Approval was given to the constitution of committees in each of the corps areas and associated naval districts to function as advisory to the corps area commander, the committees to consist of a chairman who will be the corps area representative of the Committee on Military Preparedness of the American Medical Association, one physician representing medical education, one representing hospital organization, one representing physicians in the community at large, two dentists and one representative of the veterinary profession. The state chairmen, the individual state chairmen of the Procurement and Assignment Service, are the state chairmen of the Committee on Military Preparedness of the American Medical Association.

The Committee on Medical Preparedness met in Washington on January 30 with the Procurement and Assignment Service Board and representatives of interested agencies to adopt final plans of procedure in utilizing the professional personnel of the country for the duration of the war.

The American medical profession has always risen to its obligations in time of war. During the American War of the Revolution fourteen hundred doctors volunteered. During the Civil War twelve thousand physicians served with the Federal forces and nine thousand with the Confederate forces. In World War I there were about thirty-one thousand doctors in uniform. With the projected increase in the Army of two million men

this year, another thirteen or fourteen thousand physicians will be called from civilian life. Approximately eighteen thousand are serving on the various draft boards of the country. Everywhere, in hospitals, in medical societies, all have their committees on medical preparedness in an effort to contribute to our war effort. No other group has been asked to do as much as the medical profession, and no other special group has volunteered to do as much.

The Role of Medical Education in the War

DR. HAROLD S. DIEHL, Minneapolis: In the United States sixty-seven accredited medical schools carry the responsibility for the professional education of the physicians of this country. These heavy responsibilities in times of war are multiplied manyfold.

The first responsibility of medical schools is to provide well trained physicians to meet the national needs. In normal times the five thousand physicians who graduate annually from the accredited medical schools are more than sufficient to replace those physicians who discontinue practice each year. In times of war, however, the medical services of the Army and the Navy demand a quota of physicians five to six times as high. To help meet this need, the medical schools have volunteered to increase enrolments as much as their facilities will permit and to accelerate the graduation of physicians. During the next three years about five thousand physicians will be graduated three months earlier than normal, five thousand more six months early, five thousand nine months early and five thousand twelve months early. The medical schools will be able by this acceleration of the curriculum to make available over the next three years the equivalent of one year's medical service by twelve thousand five hundred physicians. To accomplish this the faculties will have to carry heavy teaching loads, and vacations and research will have to be sacrificed. Students will forego the summer respite from studies and the opportunities which vacation periods present to earn money sorely needed by many. The deans of medical schools are convinced that there will be an adequate number of qualified applicants to supply the entering classes under the emergency accelerated program. Up to the present the uniformity of action by Selective Service boards in the deferment of medical students has been greater than would have been believed possible, but there is question whether under the increasing urgency for man power similar uniformity of action can be expected in the future.

The Army and the Navy last summer authorized the granting of commissions to junior and senior medical students with the understanding that they will not be called to active duty until they have completed at least one year of internship. This is excellent; but, unless freshmen and sophomores are kept in school and new classes admitted, it will be only a few years until there will be no juniors and seniors to apply for these commissions. To forestall this possibility the Navy Department and the War Department recently authorized the granting of similar commissions also to freshman and sophomore medical students and to students who are "bona fide" matriculants in approved medical schools.

Procedures have been outlined by the Procurement and Assignment Service to provide for retaining on faculties physicians whose services are essential to teaching and service responsibilities. Deferment of essential faculty members who are not physicians will have to be requested from the Selective Service boards with which such individuals are registered. Memorandum I-347, of Jan. 12, 1942, from National Headquarters of Selective Service, advises that "It is estimated that the expanding army will eventually require doctors and dentists in numbers heretofore unknown. They will not be available if those students who show reasonable promise of becoming doctors and dentists are inducted prior to becoming eligible for commissions. . . . It is equally important that instructors in these fields be seriously considered for occupational deferment. Shortages of qualified instructors are known to exist. The educational institution employing the instructor should be requested to file DSS Form 42A in all cases where deferment is sought."

With our country at war we cannot hope to retain our full peace time teaching forces, but, by following the procedures outlined in this memorandum, we should be able to retain teachers whose services are truly essential to sound medical education during the war.

No basic changes in the established medical curriculum are necessary. There are, however, certain medical problems peculiar to war which should be added to this curriculum. Prominent among the subjects which merit such special attention are first aid, emergency surgery, psychiatry, internal medicine, dermatology, venereal diseases, public health, tropical medicine, military medicine and aviation medicine.

A course in first aid for freshmen will provide a background for later training in emergency surgery and will prepare undergraduate medical students to play the part which would be expected of them in case of casualties or disasters among the civilian population. In the internship as well as in undergraduate teaching, special emphasis should be placed on the emergency care of fractures and wounds.

Emotionally unstable soldiers are not only worthless but a distinct liability to an army. As many of them as possible should be excluded at the time of the induction examination. Special skill, care, training and time are necessary to identify potentially psychopathic individuals and to prevent their induction. Many, however, are certain to get into the armed forces. The medical officer must be constantly on the alert. In military training emotionally unstable individuals are almost certain to exhibit suggestive symptoms, and medical officers need special training to deal effectively with these problems.

Important among the skills of the medical officer is the ability to make discriminating physical examinations of new recruits. Tuberculosis in the last war has cost this country about a billion dollars for hospital care, insurance compensation and vocational training; and these expenditures still continue at the rate of three million dollars a month. The majority of these infections were present at the time the individuals entered the services.

The use of modern diagnostic technics makes it possible to recognize practically all these infected individuals at the time of the examination. Our medical officers should be trained and provided with the facilities to use these technics. Other aspects of the physical examination for which special skills are necessary are the interpretation of heart murmurs, the estimation of cardiovascular efficiency, the neuropsychiatric examination and the examinations of the eyes and ears, particularly for aviators.

The medical departments of the Army and Navy report that newly appointed medical officers do not have an adequate knowledge of the common skin diseases.

Medical officers in our armed forces are responsible for the prevention and control of communicable diseases, the general sanitation of the camp and the safety of foods, milk and drinking water. During the last war measles, mumps, meningitis, influenza and pneumonia occurred in epidemic proportions in many camps. Additional emphasis needs to be placed on these subjects in order that graduates may be qualified for these special responsibilities.

Most of the instruction in tropical medicine will have to be given as intensive postgraduate courses because few of the medical schools have in their teaching hospitals the patients with tropical diseases essential for clinical instruction. At the undergraduate level, special attention to courses in parasitology and some consideration of the pathologic and clinical features of these diseases will serve to provide the students with an introduction and somewhat of an orientation in this field.

Courses in military medicine have already been instituted by certain medical schools. Yet it is not entirely clear as to just what such courses should include.

Some instruction of this type is desirable, but since a year of internship will intervene before medical graduates are called to active duty it is doubtful whether in the undergraduate course more than a few lectures on this subject given during the senior year are justifiable.

No special course in aviation medicine in the undergraduate curriculum is recommended. However, existing courses in physiology, internal medicine and ophthalmology should stress such subjects as anoxemia, physiology of high altitudes, perception of depth and ocular balances.

The Army and the Navy need a certain number of well trained specialists. Most of the facilities needed for the training of specialists are available. Supplementary to these the medical departments of the Army and the Navy are providing special training in their hospitals, and a few civilian institutions are offering intensive highly specialized courses in limited fields for medical officers. It is unlikely that the Army or Navy will be able to release many medical officers to take advantage of such training during the current emergency.

The last war demonstrated the importance of coordinated groups of carefully chosen physicians to serve on the staffs of special hospitals. Two years ago certain medical schools and hospitals were invited to assume responsibility for providing the medical and nursing personnel for such hospital units. In response, staffs have been organized for army general hospitals, evacuation hospitals and smaller medical units for the Navy. The staffs of these army general hospitals contain fifty-six physicians and surgeons. There is no medical school which can lose such a proportion of its faculty without serious difficulties. Those members of the faculties who remain behind must carry this undramatic but essential service as their contribution to the war. These sponsored units are splendid medical and surgical organizations which are certain to render a quality of service of which our medical schools can be proud.

Medical research has greatly reduced the hazard of communicable disease to the modern army but there remain unsolved problems of major importance. The final decision in this war will be determined not only by the number and the quality of the machines that we build but also by the stamina and the skill of the men who operate them.

The hour is late, but we hope not too late, for the investigation of problems on which will depend the effective utilization of the man behind the gun. Most of the scientists with the training and experience needed for the conduct of such studies are to be found on the faculties of our medical schools. For the past year and a half the various committees and subcommittees of the National Research Council have been outlining the problems to be investigated. There was serious delay in providing support for the investigations recommended by these committees, but funds have been made available through the Medical Committee of the Office of Scientific Research Development for the support of these research studies. To date liberal support has been provided for many investigations in aviation physiology, shock, wound infections, infectious diseases and tropical diseases. This is another field in which our medical schools are privileged to make a significant contribution to the winning of the war.

DISCUSSION

DR. ANTON J. CARLSON, Chicago: I don't suppose I should be heard at these meetings any more, but I should like briefly to comment on one of the problems that Admiral McIntire threw in our lap, namely the possible remedy for the nine long years in the preparation of modern physicians. In my school I had the privilege of teaching medical students for many years. We admitted them into the medical school after two years in college. Then we changed and I think required the bachelor's degree; that is, two years more. I have followed my students of both groups as nearly as I could. In general I have found that it didn't seem to make much difference in the caliber of work in the medical school, or in the caliber of work out in the field of their profession, whether they had two years in college or four years in college, when they entered the medical school. Now, that doesn't mean that we wasted the last two years in college. It means that the primary element in success in the school and in the life work is in the caliber of the men and women rather than in the specific courses or in the length of time spent in the college before they come into the medical school. I have heard for thirty or forty years that the medical students and the doctors should have a general, liberal education. Of course, but who is there so green as to think that that can be prescribed by any system of education or any number of courses required? That depends solely on the individual. If you will continue to be omnivorous in your study and reading both inside and outside the college, I don't think there is any other remedy.

JOINT SESSION OF THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS AND THE FEDERATION OF STATE MEDICAL BOARDS

FEBRUARY 17 — MORNING

DR. J. EARL MCINTYRE, Lansing, Mich., Presiding

Citizenship as Related to Licensure

DR. WALTER E. VEST, Huntington, W. Va.: The aim of the state in regulating a profession is to protect citizens from the ignorant, the impostor and the incompetent and to guarantee that only individuals are admitted to the professions who can be entrusted to render beneficent service. The physical well-being of the populace is so largely dependent on the medical profession that, in the interests of public health, the state must set up standards to be met by individuals who desire to practice medicine. The constitutionality of a full citizenship requirement for medical licensure has been much discussed, but the question has never been adjudicated by the Supreme Court. Generally speaking, the tendency of the courts has been to uphold a citizenship requirement in those callings which have sufficient bearing on the general welfare to demand special training, skill or aptitude. The legislatures of eleven states have enacted laws requiring full citizenship for medical licensure. In seventeen other states full citizenship is required by regulation of their respective examining boards. In only one of these twenty-eight states, Texas, has the requirement been tested in court (*Garcia-Godoy* v. *State Board of Medical Examiners*). In this instance the court upheld the citizenship requirement as "within the legitimate police powers of the state directed to the furtherance and preservation of public health, safety and morals."

The influx of alien physicians cannot but lower our professional level. Their professional education, ideals and ethics have been acquired in an environment entirely different from prevailing American conditions. Their psychology and their reaction to government are at total variance from ours. With rare exceptions their knowledge of our history, our laws, our customs and our usages is practically nil. In comparatively few instances do they have the familiarity with our language to understand us fully or to be understood clearly by us. What is more necessary in the everyday practice of medicine than a clear understanding between doctor and patient? It is not unreasonable to require the émigré physician to attain full citizenship precedent to licensure. He can accomplish this in five years. We require of native born Americans a longer period of training for medical practice. The émigré physician is escaping a country where, in most instances, he found existence intolerable. I dare say not a single émigré would exchange America with a five year waiting period to attain citizenship and licensure for the land of his birth. In the fiscal year ended June 30 last, four hundred and forty-four alien lawyers were admitted to the United States although they knew ahead of time that they could not practice their profession for at least five years. Especially in time of war, why permit any but full citizens to practice the profession which touches so intimately the lives and moral fiber of our citizenry? Why leave ajar the gates of medicine to those who might engage in sabotage, espionage or subversive activities? In the practice of medicine, physicians are often charged with duties on which the public welfare and the administration of justice depend. It is a franchise granted by the state to individuals who have attained standards set up by the state for its own protection and for the betterment of society. What is more reasonable than to demand of the foreign born seeking admission to our profession that he take time enough to attain full citizenship first; that he spend this time in learning us, our laws, ways, customs, ideals and our democracy, to say nothing of perfecting himself in the technic of American medicine and in the use of our language, and proving his loyalty to the land in which he would dwell and from which he would derive sustenance?

DISCUSSION

DR. ERNST P. BOAS, New York: The National Committee for Resettlement of Foreign Physicians has had extensive experience with the problems of the immigration of so many physicians and has been particularly concerned with this citizenship problem. Citizenship requirements were set up primarily as an excuse to keep these foreign physicans out of practice, yet citizenship is not a measure of professional ability. Many states exclude foreign physicians from licensure on the grounds of citizenship, and only citizens can be appointed to federal positions. As a result, some two thousand foreign physicians, most of them well trained, cannot practice in any form. Why not use this reservoir of trained physicians for the benefit of our country? Many, I know from personal knowledge, want to serve in the Army or in government services, but they cannot because they are not citizens. It would seem to me a function of this congress and of the American Medical Association to take measures to liberalize state and national regulations and laws, so that this country in its time of stress can use these several thousand physicians in the national defense.

DR. THOMAS J. CROWE, Dallas, Texas: I want to ask a question. I have a very strong objection now, since I know more about the émigrés. I am just as sympathetic with them as any one could be, but I know that a number of spies were sprinkled in that émigré crowd. That is the nicest way in the world to get the inside of everything. If we put those people at work in our communities we don't know what they are doing. I don't think any man is competent to practice medicine in the United States until he can speak our language. Many of them can't speak our language. I think we had better go a little slow on what we do with those people in this country until we know more about them.

DR. JULIAN F. DU BOIS, St. Paul: In the last several years we have had about twelve thousand applications for entrance to our medical schools which have taken only from five to six thousand a year and specified that we must have class A schools. To the best of my knowledge there is no evaluating board to go into the credentials of foreign schools. If you take two thousand foreigners whose education cannot be verified by the American Medical Association as to the class of school, it seems to me that you are penalizing American boys. It is not the doctor of today that we should worry about. The boys who want to be doctors we have prevented from becoming doctors. You talk about putting these men out, as the refugee committee has suggested, in the place of the men who are in the service, give them their work and let these men come back and get a practice, if they can. If, when a man goes into the Army and gives his all, his place should be given to some foreigner who is in tough luck, that is not my idea of Americanism.

DR. WALTER E. VEST, Huntington, W. Va.: My idea was that these men are here, and we ought to train them for entrance into the American profession; that in the five years required to attain full citizenship they should serve internships in hospitals that are in need of interns. Thus they can be trained in five years to go out and do reasonable work. They certainly do not fit into American life today. I was amused at what Dr. Crowe said about the use of the English language. Until very recently, at any rate, his state provided for the use of interpreters to examine foreign born physicians. That may still be on the statute books of Texas. I have known some émigré physicians who are really fine men. I have known some who were horrible and the percentage of the latter was rather high. My point of view has been developed by being a member of a licensing board for ten years and having come in contact with many émigré physicians. I think that the solution to the problem that I have presented is not unreasonable. I noticed that General Parran yesterday did not say that he would take any of these men into federal service. He suggested that they be allowed to go out into private practice; but I feel that the safety of this republic now, in our hour of trial, depends on not allowing an infiltration of foreigners who may be saboteurs or spies or may be engaged in subversive activities.

DR. CROWE: We don't give them an examination in their own language any more. That is out.

Access to Hospital Records: Some Legal Aspects

MR. T. V. MCDAVITT, Chicago: This paper appeared in full in THE JOURNAL, May 2, page 88.

DISCUSSION

DR. IRVIN D. METZGER, Pittsburgh: Since this is the only paper on matters of record, I should like to bring in the other phase of it. There are two persons concerned, as far as the accuracy of records is concerned. One is the attending physician and the other is the hospital. The attending physician is the last resort in law in respect to the accuracy of the record. Interns or others who have to do with the case are dependent on the physician who supports the record. Even the laboratory workers are responsible to the physician rather than directly responsible to the law for the accuracy of the record. It is important that the physician in charge of the case be very careful to subscribe, by signature in the records, to the findings and activities relative to the case in every respect. In our state, where record keeping has been a matter of evolution during the last twenty-eight years, we have come to emphasize certain points. One is that every person who is admitted to the hospital shall have a careful survey made of the entire physical condition, regardless of the type of service that the patient may request, so there shall be on the record every significant thing in respect to the physical condition of that patient. Again, at the close of the service in that particular case there shall be a careful survey made of the general condition. We require each physician in charge of the case to make a notation of three things: (1) the general condition on discharge, (2) the condition of the part treated and (3) the disposition of the case for future care. If the patient is discharged with no disposition indicated on the chart for future care, somebody may be held responsible. The follow-up worker each morning can go into the record room and make notes of what the doctor desires in respect to that patient in the future. It is her duty to follow up those directions. That gives specific direction to the follow-up worker's activities throughout the day and makes possible a return report to the doctor with regard to the condition of the patient.

DR. W. S. LEATHERS, Nashville, Tenn.: I should like to ask a question. Speaking of the uses of patients for teaching purposes, I did not catch the exact meaning. I would infer that he was speaking of private patients. It seemed that the statement made was something of a generalization that might be misused with reference to the use, for example, of a semiprivate patient. I would like a more definite statement with regard to whether or not a patient would have just rights in the use of such records.

DR. CHARLES GORDON HEYD, New York: At the New York Postgraduate Hospital we have had to deal with this problem. A few years ago a junior gynecologist got a blanket permission to review all the cases in that hospital. In his review he came upon a female patient who had a positive Wassermann reaction and who was to be married soon to one of his friends. He told that friend, and there was a commotion about it. I think the hospital was saved a lawsuit by nature of the complaint of the lady and by the fact that the gentleman married her anyway. We have a lot of requests from one of the junior men to review all the carcinomas of the thyroid. A committee was appointed to study this condition, and we arrived at the following conclusions: A person could have access to the charts of all so-called ward service patients on the consent of the director of the service. He could not have access to semiprivate or private patients without a specific authorization from the attending physician to the record librarian. Out of that came another angle, that the director of a service might wish to evaluate or appraise the service of one of his juniors, and he, the director, heretofore has been in the habit of taking all the patients of that particular individual and reviewing the charts. The committee believed that that was fundamentally illegal and wrong, so it limited the ability of the director to review only the cases of this junior that were admitted to the service, and the director would have to obtain the permission of his junior to review his private and semiprivate patients. An interesting condition occurs in the large city where a doctor has been the attending

physician of a patient. The patient has left him. He later wants to chisel in on the information that the hospital has obtained. He writes in and states that he was the attending physician, or he may leave the impression that he was still the attending physician and ask for the information. We have always maintained the rule at the Postgraduate that any request for such information must be legally buttressed by a signed request and authorization from the patient for the giving out of that information. Anything short of the most complete safeguards lays the institution and the attending physician open to unending possibilities of lawsuits.

Mr. George E. Hall Jr., Medinah, Ill.: As I understand Dr. Leathers' question it is whether or not any differentiation should be made between the records of a private patient and a semiprivate patient, as far as the use, by the hospital, of those records is concerned. In my opinion, I would say that as a general rule it is always best to get the consent of the hospital, whether the patient happens to be a private one or a semiprivate one, because even though the person is a semiprivate patient, that person still has the same legal rights, as far as protection from an invasion of his right of privacy is concerned, as any private patient would have. I think the procedure explained by Dr. Heyd illustrates that it is best to get the consent of all patients, wherever it is possible. Even then the records should be so used that the identity of the patient is not revealed, because that again would open the question of the patient's right of privacy. I thank Dr. Metzger for his view on the need for the doctor and the hospital to be most careful in making records, because in many a malpractice suit, or suit for negligence against the hospital, not only what is in the record but what has been left out is often important. Anything that the attorney for the plaintiff thought should be in there is always a fertile ground for argument to the jury.

The Function of the State Hospital as an Educational and Social Agency

Dr. Winfred Overholser, Washington, D. C.: This article appeared in full in The Journal, March 28, page 1027.

DISCUSSION

Dr. Barrow, New York: Dr. Overholser spoke of the mental hospital rendering service in a number of directions in the community. In most states there are only one, two or three mental hospitals, so that an institution would hardly be able to function over a radius sufficiently large to render service. What would he suggest, at a state level or county level, that the existing agencies might do in the direction of preventing persons who represent departures from the normal from being institutionalized? In some instances, one person in every twenty-five or thirty is spotted as presenting some kind of an emotional problem. They are not all mental cases. In those communities is the responsibility most largely in the welfare department, in the health department or in the educational department, and how might the forces be best equipped to carry forward preventive aspects of this problem?

Dr. R. N. Whitfield, Jackson, Miss.: The author stated that in Mississippi these patients are admitted into the hospital by juries. That has been the case, and perhaps the law still is on the statute book, but no patient gets into our hospital without a thorough examination by the hospital physician himself. The institution in Mississippi—and, we have two of them—cost seven and one-half million dollars and is perhaps one of the finest institutions in the United States.

Dr. Winfred Overholser, Washington, D. C.: As for prevention that is a very important field. The economic necessity of it in this particular field is impressing itself in general on appropriating bodies. I question whether the average county is in a position to set up an organization which could do the job properly. Nearly every state now has state supervision rather than county supervision of the care of the mentally ill. Obviously, the campaign against syphilis is one thing which ought to be prosecuted vigorously from the psychiatric as well as the medical point of view. More important, if possible, is the attacking of the problem in the early years of the individual. It is well established that in many of the cases which get as far as the hospital, on going back into the history of the individual one finds that there were behavior disorders in early life. A fair proportion of those certainly are amenable to some treatment and guidance. The establishment of mental hygiene clinics throughout the state is probably one of the best economies that a state can engage in, when it comes to the point of view of saving the cost of later building and in salvaging the lives of these individuals. The development of laws which permit the early admittance and the voluntary admittance of persons in the early stages of mental disorder is one that ought to be encouraged.

Dr. Barrow: Which agency do you think, within the state, has the major responsibility? I am quite aware that it is widely distributed, but the agency which has the major responsibility perhaps should give leadership.

Dr. Overholser: It is a strange thing that, so far as I am aware, no state has entrusted the care of the mentally ill to the health department of the state. It is extraordinary. We have the hangover of the colonial laws still, that call for the treatment of the mentally ill in the same class with paupers. We still find them cared for, in a good many places, with supervision of a department of public welfare. If a state is large enough, there ought to be a separate department, I should say, which is headed by a psychiatrist. If not that, certainly a bureau headed by a psychiatrist, I should say preferably in the department of health. I hope to see the day when this problem is going to be recognized as a medical problem instead of one of welfare. In the meantime, however, it is encouraging to know that the profession is developing a psychiatric consciousness, and it is important that all who come into contact with welfare problems should be oriented from that point of view, so at least they will recognize the sort of cases that ought to be turned over to these psychiatric clinics.

Acceleration of Medical Training in Canada

Dr. E. Stanley Ryerson, Toronto: Acceleration of the medical curriculum was first propounded to the deans of medical colleges in Canada in May 1941. The deans were informed by the director general of the medical services that about 10 per cent of the doctors in Canada had enlisted in the army, navy and air forces. He presented statistics of the estimated need for doctors and asked if the deans could suggest a method that would help his department to meet this demand. A shortage of doctors existed for service in the armed forces and also for civilian needs. Of the eleven thousand doctors in Canada over two thousand are now in the armed forces. The ratio of doctors to population before this depletion was one to one thousand and now is one to over twelve thousand. The need for more doctors is apparent. Requests have been received from Great Britain in both the United States and Canada for more doctors. The problem was Could the medical schools devise a method for the graduation of doctors more rapidly?

The deans presented the following resolutions to the Director General as possible steps in meeting the demand for more doctors in the immediate future.

Be it Resolved:

1. That, because of the shortage of doctors both for the armed forces and for civilian needs, the medical schools of Canada be requested to speed up graduation of medical students during the war emergency.

2. That hospitals in Canada be asked to accept eight months internship in lieu of twelve months, in order to provide medical officers for military service at an earlier date.

3. That provincial licensing colleges or boards be requested to modify their regulations to permit the curriculum to be completed in a shorter time than their regulations now require.

4. That, as a considerable proportion of medical students depend for maintenance and tuition on their vacation earnings, which under the proposal would be seriously impaired, the dominion government be asked to assist in the financing of students and of the instructional staff where this is necessary.

The Director General asked the deans for an estimate of what financial assistance would be required to reimburse the university relative to its instructional staff, to finance the students, and the number of students involved. Another telegram arrived, stating that financial estimates submitted were such the Faculty

of Medicine of the University of Toronto decided that the question of securing financial assistance for students or staff should not interfere with the speeding up scheme and it reaffirmed its former decision that the medical course for all years be started on August 25. The graduating class began its sessions a month earlier than usual and will sit for its final examination (which will be conducted coincidentally by the university and the medical council of Canada) at the end of March and early in April. Its members will graduate in time to enter on their internships on May 1, in which positions they will remain until December 31, when they will be released for military service.

TABLE 1.—*University of Toronto Course: Graduation, Internship, Military Service*

1941-1942	Graduation	Internship	Available for Military Service: Speeded Up Course	Available for Military Service: Regular Course
Sixth year	April 30, 1942	May 1, 1942 to Dec. 31, 1942	Jan. 1, 1943	July 1, 1943
Fifth year	Dec. 31, 1942	Jan. 1 to Aug. 31, 1943	Sept. 1, 1943	July 1, 1944
Fourth year	July 30, 1943	Sept. 1 to April 30, 1944	May 1, 1944	July 1, 1945
Third year	April 28, 1944	May 1 to Dec. 31, 1944	Jan. 1, 1945	July 1, 1946
Second year	Dec. 31, 1944	Jan. 1 to Aug. 31, 1945	Sept. 1, 1945	July 1, 1947

TABLE 2.—*University of Toronto Course, 1941-1942*

First Term	Second Term	Third Term		Fourth Term
Aug. 25 to Nov. 1	Nov. 3 to Jan. 17	Jan. 19 to April 4		April 13 to June 27
Sixth year	Sixth year	Sixth year		
Fifth year	Fifth year	Fifth year		Sixth year
Aug. 25 to Oct. 18	Oct. 20 to Dec. 20	Jan. 5 to March 28	March 30 to April 11	April 13 to June 27
Fourth year	Fourth year	Fourth year	Vac.	Fifth year
Third year	Third year	Third year	Vac.	Fourth year
Second year	Second year	Second year	Vac.	Third year

TABLE 3.—*University of Toronto Course: Progress of Each Class*

	First Term	Second Term	Third Term	Fourth Term
1941-42	Sixth year	Sixth year	Sixth year Graduation, April 30, 1942	
1941-42	Fifth year	Fifth year	Fifth year	Sixth year
1942-43	Sixth year	Sixth year Graduation, Dec. 31, 1942		
1941-42	Fourth year	Fourth year	Fourth year	Fifth year
1942-43	Fifth year	Fifth year	Sixth year	Sixth year Graduation, July 30, 1943
1941-42	Third year	Third year	Third year	Fourth year
1942-43	Fourth year	Fourth year	Fifth year	Fifth year
1943-44	Fifth year	Sixth year	Sixth year	Sixth year Graduation, April 30, 1943
1941-42	Second year	Second year	Second year	Third year
1942-43	Third year	Third year	Fourth year	Fourth year 3T
1943-44	Fifth year	Fifth year	Fifth year	Sixth year
1944-45	Sixth year	Sixth year Graduation, Dec. 31, 1944		

In table 1 the schedule for the five years now in attendance at the University of Toronto is shown, indicating the dates of graduation, of the internship and of being available for military service, under the speeded up course, and under the regular course.

In table 2 the dates of the four terms in the University of Toronto course are shown for the session 1941-1942, the regular curriculum for each class being completed during the first, second and third terms by the end of March, and the curriculum of the first term of the next succeeding year between April 13 and June 27. In the fourth, third and second years a two weeks vacation is given after final examinations, before starting on the work of the fourth term.

In table 3 the progress of each class is shown from its beginning on Aug. 25, 1941 up to the date of graduation.

This accelerated scheme was adopted only by the University of Toronto, the other schools with the exception of McGill, which already has a thirty-six week session, being unable to do so, owing to financial assistance for their students and staff not being forthcoming. Four of the latter started their final year in July and their students will graduate, become licensed and enter on their internships three months earlier than they would ordinarily.

The adoption of such a speeded up medical course can be carried out with practically no fundamental change in the date of completion of premedical education or in the order and length and distribution of the courses.

Education in Industrial Health

DR. STANLEY J. SEEGER, M.D., Texarkana, Texas: This article appeared in full in THE JOURNAL, March 21, page 1017.

The Integrated Course in Anatomy

DR. B. I. BURNS, New Orleans: Modifications in the curriculum of the medical schools during the past twenty-five years have brought much criticism of the standard course in anatomy. The clinical teachers feel that the presentation of the subject has become too academic and that the student's effort is not directed in such a manner as to give a foundation knowledge of the structure of the body which adequately supports his practical training. Realization of some of the defects in the training offered medical students led the staff of the Department of Anatomy of Louisiana State University to consider integrating the four courses in anatomy (gross anatomy, histology, embryology and neuroanatomy) into one course in the hope of providing better opportunities for correlation of anatomy with function and with the clinical fields. The idea was not original. Hooker and his colleagues at the School of Medicine of the University of Pittsburgh abandoned the teaching of separate courses in 1924 and began the experiment of a single

correlated course in anatomy. In each school in which it has been attempted, the integrated course has been proclaimed an unqualified success. Our experiment with it has been under way for seven years. The difficulties of organizing an integrated course in anatomy are largely concerned with determining the proper sequence of various phases of the study. The order is simple, but it calls for the preparation of a laboratory outline, a laborious task. The guiding principle calls for complete gross and microscopic study of a part at one time rather than gross study today and microscopic study two or three months hence. The course begins with a microscopic study of early embryology and the structure of the primary tissues. This training lays the foundation for the microscopic study of the structure and development of any organ. At its conclusion, dissection of the body is begun and from this point the gross study sets the pace for the microscopic. At the opportune time during the gross study of a structure, a laboratory period is scheduled for the study of its microscopic structure and its embryology.

The first seven chapters of the laboratory outline consist of directions for the study of early embryology and the primary tissues. This phase of the study constitutes the first division of the course. The early embryology presentation consists of a study of the development of the fertilized ovum through the formation of the primary germ layers and the fetal membranes. The second division of the course consists in a study of the upper extremity and back. Preceding the beginning of the gross study of this or any other region the student is stimulated, through occasional lectures and frequent quizzes, to familiarize himself with the osteology concerned. The initial laboratory period is devoted to a thorough study of surface landmarks with emphasis on their practical significance. The study of the skin is begun with its gross consideration and reflection of it over the pectoral region. This gross study is followed by the microscopic study of the structure of the skin, skin glands and hair. Next in order is the consideration of the superficial fascia which is reflected. During this procedure the mammary gland and axillary lymph nodes are exposed and studied grossly and finally microscopically. As the dissection progresses, nerves and blood vessels are soon encountered for the first time and are studied microscopically. There is no very good reason for beginning the dissection of the body with the upper extremity. It may be begun anywhere, depending on the whims of the instructional staff but, once it is begun, the accompanying histologic and embryologic studies must be assigned in proper order.

One question frequently raised regarding the integrated program has to do with the amount of time saved. Our experience has not indicated an economy of time in the form of reduction in the total number of hours which may be devoted to the study of anatomy. Perhaps such a course could be organized and conducted in such a manner as to conserve time to some extent. No such objective was contemplated in our course plan. Such an accomplishment could be effected only by avoidance of repetition. Teachers of anatomy will probably agree that frequent recapitulation of ground covered in such a course is desirable if important facts are to be retained. One great advantage in the integration method is that it provides frequent opportunities for recalling knowledge previously gained and correlating it with that based on the study immediately at hand. Repetition becomes a fascinating procedure for teacher and student, and the possibilities offered for accomplishing it in a more natural manner constitute one of the chief advantages of the method. Complete correlation of structure with function and clinical consideration is impossible until all the information regarding the anatomy of the part in question is at hand. Therefore many opportunities for intelligent teaching and study are provided in the integrated course that cannot be found in any other method of approach. By no other means can the sort of consideration be given to the study of an organ or part that simulates the mental approach the practicing physician must adopt. I have never heard an unfavorable evaluation of the method by a teacher or student who has participated in it. Participation in the teaching of such a course requires a teaching knowledge of all the phases of the subject. Each member of the staff must be a complete anatomist. This requirement constitutes one of the great advantages of the method. The organization and conduct of the integrated course present no serious problems.

DISCUSSION

DR. THOMAS J. CROWE, Dallas, Texas: Anatomy is one of the most neglected subjects of the college curriculum. I have asked many a recent graduate to give the name of the only spinal nerve which enters the viscera of the body, and I have failed to find one who could.

THE FEDERATION OF STATE MEDICAL BOARDS

FEBRUARY 17—AFTERNOON

DR. J. EARL MCINTYRE, Lansing, Mich., Presiding

Industrial Health as Related to Licensure

DR. C. O. SAPPINGTON, Chicago: Within the last year the Medical Education Committee of the American Association of Industrial Physicians and Surgeons has presented a report of a plan for the study of industrial hygiene and medicine in medical schools, with an outline of courses for undergraduate students. This report has been accepted by the board of directors of the American Association of Industrial Physicians and Surgeons and has been sent for further consideration to the American Medical Association. The dearth of trained industrial physicians has been disclosed in the evaluation of the available personnel for industrial uses during the war, through the Medical Preparedness Committee of the American Medical Association. At the annual meeting of the American Conference on Industrial Health in November 1941 Dr. Rosco G. Leland, Director of the Bureau of Medical Economics of the American Medical Association, presented figures on the availability of industrial physicians and surgeons. Among 157,000 physicians who returned questionnaires, 11,300 received schedules asking for specific information concerning their activities in industrial practice. Of these about 7,500 have returned the special schedules pertaining to industrial practice, and of these 5,700 have been processed for punch cards and about 4,000 have been run through the machines, making the following figures available: 2,967 were engaged in general industrial practice, 677 were engaged in traumatic surgery, 139 were occupied in plant medical department administration, 24 in occupational disease control, 24 in governmental industrial hygiene administration, 49 in workmen's compensation administration, 35 in private industrial hygiene as private industrial hygiene consultants, 17 in industrial toxicology, 18 in casualty insurance administration, 5 in industrial hygiene teaching and 4 in health education of employees.

In the next edition of the American Medical Directory, listed with other specialties will be the specialty of industrial practice. Heretofore industrial surgery has been listed as a specialty, leaving, however, the medical and the industrial hygiene phases without a category in which to be placed unless one choose to be listed as a specialist in public health. This change is encouraging.

Some of the reasons why a relative minority has been attracted to industrial practice are: 1. Lack of applying a uniform plan for adequate undergraduate instruction in industrial subjects in recognized medical schools. 2. Continued abuses over many years in industrial practice, by persons of unrecognized standing, consequent on the absence of official regulation and standards for qualification; this naturally resulted in commercial exploitation. 3. The habit of well meaning general practitioners using supplementary industrial practice as a "stepping stone" until private work reached the desired volume. 4. The apathetic public reaction, reflected in slow recognition of the necessity for the passage of industrial health legislation.

Some difficulties in teaching undergraduates and physicians the fundamentals of industrial hygiene are found in the necessity of the application of industrial hygiene engineering and chemistry to the problems of prevention and in the investigation of occupational disease claims. These difficulties are not insurmountable. Already a considerable number have become sufficiently

well grounded in these technical subjects to give instruction both to undergraduate students and to practitioners in the field. A notable example of postgraduate education of the "refresher" type was conducted during the past year by the Iowa State Department of Health under the direction of Dr. Walter Bierring. In nine cities specially selected in Iowa there were afternoon and evening meetings on industrial health subjects, varying from consideration of wounds and orthopedics through industrial toxicology, industrial hygiene engineering, the administration of health services in industry and problems of medicolegal importance. Those present believed this a successful method of bringing to the general practitioner fundamental information on these subjects, instead of expecting him to attend meetings at a distance voluntarily.

As to licensure, questions relative to industrial hygiene and occupational diseases have been asked in state board examinations. Dr. Harold Rypins, in his book on "Medical State Board Examinations," devoted four pages to industrial hygiene and allied subjects. A rational basis for the solution of this problem involves medical education of undergraduates and practitioners. As desirable as it might be to include questions in state board examinations relative to industrial health, it would be unfair to do so unless organized instruction had been previously given to those who take the examinations. It is suggested that consideration be given to the appointment of a committee on the teaching of industrial health, which could study the problem and make working recommendations to medical schools, examining boards and qualifying groups.

DISCUSSION

DR. WALTER BIERRING, Des Moines, Iowa: Dr. Sappington is emphasizing the necessity of incorporating in the examinations of candidates for licensure questions regarding industrial hygiene, occupational disease and industrial health. It takes sixteen men working in industry to support one man at the front, and to keep these industrial workers well is most important in national defense today. The men who are now coming out to practice are efficient in the knowledge of industrial hazards, exposures of various kinds. Their knowledge of occupational disease is lacking. We should recognize that industrial hygiene, occupational disease and industrial health are a most important part of the practice of medicine.

Licensure Problems in the District of Columbia

DR. GEORGE C. RUHLAND, Washington, D. C.: A Commission on Licensure was created by act of Congress on Feb. 27, 1929 to regulate the practice of the healing art in the District of Columbia. The act provides that the following shall be members of the commission: the president of the Board of Commissioners, the United States Commissioner of Education, the United States District Attorney, the Superintendent of Public Schools and the health officer, who functions as secretary-treasurer. The commission members serve without compensation. The commission, being four fifths a lay body, has on occasion adhered so closely to the wording of the law that well qualified physicians were denied licenses. The act required all licentiates of the former Board of Medical Supervisors and all drugless healers to be licensed. Prior to 1929, drugless healers were not licensed in this jurisdiction, and probably because of this all healers were required to be licensed under the new law. Drugless healers were licensed on the basis of practice prior to the passage of the act. Since that time all have been required to pass the basic science examination as a condition precedent to admittance to the professional examinations.

There are three methods by which a person may obtain a license to practice medicine in the District of Columbia: examination, reciprocity and endorsement of the National Board diploma. Graduation from an approved American or Canadian medical school and one year's internship in a class A hospital are a condition precedent to admittance to the District of Columbia medical examination. The examination is written and lasts four days. A person seeking a District of Columbia reciprocal license is required to satisfy the reciprocal requirements set forth in the act. The applicant must be over 21 years of age, of good moral character and a graduate of an approved medical school. He must also have been licensed by regular written examination, show practice the last two years under authority of the license used as a basis for seeking reciprocity and must satisfy the commission that the jurisdiction whence he comes grants like privileges to licentiates of the District of Columbia. Federal service may be offered in lieu of private practice. The commission investigates the record of all applicants for local licensure so that only well qualified physicians with clear records are admitted to local practice. A diplomate of the National Board of Medical Examiners is eligible to apply for license on the basis of the National Board diploma; the commission procures the diplomates' first and second papers from the National Board and in turn refers them to its basic science and medical examining boards. On the examining boards' favorable recommendation the commission may issue a license without examination. The act provides for the registration of commissioned surgeons of the United States Army, Navy or Public Health Service or medical offices in any other branch of the federal government in the discharge of their official duties. Such registration is effective only as long as the officer's official status remains unchanged. The act also provides for the registration of physicians in adjoining states who have occasion to treat or hospitalize a few specified patients in the District of Columbia. This registration does not permit the holder thereof to open an office or do a general practice in this jurisdiction. The act exempts massage, dietetics and physical therapy if done under the direction of a person licensed to practice the healing art in the District of Columbia.

I want to call attention to Mr. Foley's work in clearing up the classified section of the Washington telephone directory. In conjunction with officials of the telephone company he succeeded in reducing the number of unlicensed persons listed under "Physicians and Surgeons, M.D." from seventy-five to four. Over a hundred cases have been investigated by this office, with numerous prosecutions.

At present the ratio of practitioners to population is 1 to 228; this figure includes federal physicians, based on an estimated population of 770,000. The District of Columbia has 2,138 licensed medical doctors, 848 federal physicians and 375 osteopaths, chiropractors and naturopaths.

When the act was passed in 1929, no provision was made for annual registration. The commission is self supporting in the sense that revenue is derived solely from application fees. There has been a decrease in applicants since the national emergency and a drop in funds to maintain properly the office of secretary-treasurer. Another problem is the physician who appeals to Congress for a special bill to permit him to practice in the District. Because special acts of Congress are a matter of public record, some graduates of second and third rate medical schools got the idea that a special bill should be introduced in their behalf. They knew they were not eligible for admittance to the local medical examination or eligible for reciprocal licensure, but that did not make any difference. They "camped on the Hill" and not long thereafter a special bill appeared authorizing and directing the commission to issue the license. In some instances the individuals applied to the commission first; in other instances they just didn't bother. Why take the time to get in touch with the licensing agency when they were going to be licensed by special act of Congress anyway? It is fortunate that these bills are referred to the District of Columbia Board of Commissioners and in turn referred to the commission. We oppose the special bills as a matter of principle and in each instance point out the applicant's lack of qualifications and request Congress to let the commission pass on applicants entirely on their merits.

There is pending in Congress a bill to require annual registration and another requiring citizenship as a condition precedent to licensure in the District of Columbia. One foreign physician applied for a reciprocal license, and his application was rejected twice on its merits. He appealed to Congress, and the commission was authorized and directed to issue him a license. By special legislation he was granted a privilege denied American citizens who failed to satisfy local licensure requirements. The national emergency may necessitate a broader interpretation of rules and regulations dealing with medical licensure. The commission, however, will not relax its standards and will insist at

all times that a person licensed to practice the healing art in the District of Columbia be well trained and a man of good moral character.

Have Basic Science Medical Laws Advanced the Skill of Doctors or Improved the Public Health?

DR. T. J. CROWE, Dallas, Texas: I can't understand how two examinations for license can possibly be of help to anybody except the incompetents, whom they dignify and with licensure embolden to extend their pernicious practices. I've wondered why the framers of the basic science acts did not realize that the drugless healer's colleges could give their students "quiz compend or Goepp courses" sufficient to pass the five subjects before a nonmedical board of examiners, by whom no practical laboratory tests are given.

What's the use? 'Twill be only a few months, at most, until some "smart guy" discovers that all physical and mental ills of mankind emanate from "a kinked little toe" or that anterior subluxation of "Adam's apple" is enemy number 1 of the human family, when the mob will flock to them, and we'll have all to do over again. Only in healing would such burlesque be tolerated for a single hour, unless the fellow who said "Life is just one damn thing after another" was right.

I'm amazed that the church people haven't taken up the basic science idea and asked for a statute requiring that all atheists and infidels shall study and pass examinations in the ten commandments and the Lord's prayer, that the A's and I's shall be the better prepared to deny and to blaspheme their creator.

After fifty years' experience with the sick, I'm of the opinion that all persons must be protected against their own lack of information or judgment in matters involving technical skill, as well as against deception and imposture by public servants. The state owes to its people to enforce "one" safely high, uniform standard for the issuance of license to make a living off the misfortunes of the sick. Every doctor, regardless of method, must be a competent diagnostician. Every doctor should know all that may be learned in a reasonable period of years of study and training under the tutorage of recognized, competent instructors. Regardless of his methods, every doctor must be educated and adequately trained but above all he must be a competent diagnostician.

I cannot understand why the public and the reputable medical profession should not maintain and enforce beneficent, scientific principles and technics and not give licensure to every racketeer with a theory of the cause of diseases and a ridiculous manipulative cure for them. Texas has maintained since 1907 a single standard for all who would engage in the treatment of the sick, regardless of school of graduation or method of practice. All must be measured by the same yardstick, and all who measure up to the specifications are citizens and graduates of reputable colleges and are given identical privileges of licensure to practice medicine and surgery by any method not in conflict with the criminal statute and this is as it should be the world over. We've had to fight through every session of our legislature to maintain it. Except for its definition, which I've tried many times to have amended, the Texas medical practice act is the most consistently impartial medical law of the United States. We tried the multiple practice acts, multiple boards and multiple limited licensure from 1901 to 1907, when we found we had developed a multiplied chaos which we could no longer tolerate. The present amended act eliminated that system.

DISCUSSION

DR. CARL G. PATTERSON, Baker, Ore.: If they will adopt a basic science law in Texas they won't have that trouble. We have tried it in Oregon for six or eight years. During that time we have not a single chiropractor or naturopath who has passed that examination. That should be sufficient recommendation for continuing the basic science law in Oregon.

CHARLES CARTER, PH.D., Fairfield, Iowa: We have had a basic science law in Iowa since 1935. There are many improvements to be made in the basic science law which we have in Iowa. The basic science is a screen which takes out a good many that never come before the licensing boards. The basic science board in Iowa is not a licensing board in any sense. It seemed to me that Dr. Crowe had that idea in his discussion.

DR. JULIAN F. DU BOIS, St. Paul: In 1927 Minnesota passed her basic science law. At that time we had about 300 osteopaths and 600 chiropractors. We now have 160 osteopaths and 300 chiropractors. Prior to 1927 our average five year period was licensing 46 chiropractors. We have no brief with Dr. Crowe on his chiropractors but the subject was basic science. In Minnesota it has worked.

O. E. MADISON, PH.D., Detroit: Our law in Michigan was passed in 1937, but one of the other branches of it, the chiropractors and osteopaths, brought suit against the board to declare it unconstitutional. So it didn't get to functioning until 1939. I agree with the doctors from Iowa and Minnesota that it serves as a screening affair, to keep out those who might otherwise get in. We are trying in Michigan to work out a means whereby we can get more cooperation between the various boards, that is, the state board of examination in chiropractic and osteopathy and medicine, whereby the chiropractic people and the osteopathic people will realize from the beginning that they are up against something. If it doesn't do anything more than strengthen the kind of work that is given in those six subjects in the various schools, it will have served a helpful purpose.

DR. J. W. BOWERS, Fort Wayne, Ind.: Last year I gave a paper on this subject, and there was a committee of the basic science boards that promised to give a reply this year on reciprocal relations. So far I have not heard anything about that. I am afraid we are throttling the medical profession in order to inhibit certain cults or irregular practitioners to our own disadvantage. Each person who qualifies medically takes the basic science subjects before his respective state medical board. If he does this once, it ought to suffice for life. He should not be required to repeat these examinations in the basic science subjects any more than he should take the examination in all the clinical subjects. If we are going to have the basic science subjects, let's reciprocate with the medical doctors or those who do take the sciences, when they desire to go from one state to another. I defy the average medical man who has been in practice for fifteen to twenty-five years to pass these basic science examinations. To take these examinations every time they might desire to reciprocate from one state to another would be practically an impossibility with the average practitioner of medicine.

DR. CARTER: At the last meeting there was a motion made to establish a committee but for some reason that information was never conveyed to any members of our basic science boards. Therefore when he says that has not come from the board it is because we have had no official notice of it.

PRESIDENT MCINTYRE: That is true, Dr. Carter. They were invited to attend this meeting in the hope that they might perfect their own basic science organization, whereby it would eliminate the retaking of basic science board examinations by the medical men who were reciprocating from one state to another. We hope that you men of the basic science boards will perfect this organization. I believe the federation would agree in extending to you an invitation to come back next year and have a representation from each basic science board. We hope that you will perfect that organization.

DR. CARL G. PATTERSON, Baker, Ore.: As I remember, last year a motion was made that the secretary of this federation extend to the representatives of the sixteen basic science boards an invitation to be present at this federation meeting. I move that that invitation be extended to the representatives of these basic science boards to meet with us next year.

DR. DU BOIS: I second it.

DR. T. P. MURDOCK, Meriden, Conn.: I am not a member of the healing arts board in Connecticut but I am familiar with the operation of the law in Connecticut. We were the second state in the United States to adopt a basic science board. A provision was placed in the law covering the situation that has been discussed this afternoon. The law provides that a man who has been in practice in another state for three years will be certificated by the healing arts board without examination. A man who has been in practice in another state for a period of five years need not appear for certification or examination before the healing arts board. After seventeen years of basic

science board in Connecticut, we are thoroughly sold on it. We believe it screens not only poor practitioners of our own but also screens very carefully all the members of cults.

[The question was put to a vote and carried.]

DR. CROWE: I had no idea that the basic science was a licensing board. I mentioned the fact that they had to take two examinations for license to practice. I have heard it said that some of these boards, since they have organized the basic science board, haven't licensed a single chiropractor. We have never issued a chiropractic license; still we have men who are not licensed and are practicing in violation of the law, and you are not convicting them. If we have a medical science that is worth defense, why give some fellow a living to fool people every day? Wisconsin adopted basic science and left bacteriology out of it absolutely. Worst of all, they have all left diagnosis out. If we are protecting the public, let's do it. The basic science law was not called for by the public. It was called for by the medical doctors. Diagnosis means something to the public, and we should have diagnosis in our basic science. I am against having more than one license certificate.

Revision of Constitution and By-Laws

PRESIDENT MCINTYRE: The next item is the consideration of the revision of the Constitution and By-Laws of the Federation of State Medical Boards of the United States.

DR. I. D. METZGER, Pittsburgh: I move that they be adopted as proposed.

DR. WHITFIELD (Mississippi): I second the motion.

DR. PATTERSON: I move to amend the motion so that section 3 shall read as follows:

> All the individual members of each state medical board member are ex officio fellows of this federation so long as they legally are members of such state medical board.

C. B. BLAKESLESS, Indianapolis: I second that motion.

PRESIDENT MCINTYRE: All in favor of the amendment will say "aye". The motion is carried.

PRESIDENT MCINTYRE: The Constitution and By-Laws as amended are declared adopted.

GENERAL DISCUSSION

DR. WILLARD C. RAPPLEYE, New York: I regret I wasn't here yesterday on account of the discussion regarding the accelerated program. We are deeply appreciative of the action taken by your federation in support of our desire to participate in this national emergency program. Sixty of the medical schools already have signed up to do it; three have indicated that they will not be able to accelerate; two of them have good reasons and one doesn't. The great majority of the schools are prepared to do their part in the national emergency.

DR. WALTER BIERRING, Des Moines, Iowa: Then you would change "matriculation" to "from beginning instruction to graduation"?

DR. RAPPLEYE: The thirty-six months bother us. Matriculation, in the university sense, is the beginning of instruction. Matriculation, as now announced by the War Department in the granting of commissions in the Medical Administrative Corps, is any time that the student is accepted and pays a fee. A fee of $1 is all that is necessary for him to become a matriculated student. Therefore he can matriculate nine months in advance of his beginning instruction. We don't want to have any confusion with your boards about that, because there is a technicality there some of them would pick up. Our idea would be that your thirty-six months period should be from the period of the beginning of instruction of the first year of medicine until the actual signing of the diploma.

DR. R. N. WHITFIELD, Jackson, Miss.: I move that we change these phrases to conform to Dr. Rappleye's suggestion.

DR. METZGER: I would like to second that.

DR. RAPPLEYE: Is it not true that there are states that could not legally recognize a diploma granted thirty-five and one-half months after instruction?

DR. BIERRING: Yes, two states and the District of Columbia.

DR. RAPPLEYE: So it is up to us to change all diplomas to make sure that the dating of no diploma is less than thirty-six months after the beginning of instruction in the first year.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE

CHICAGO, Feb. 15-16, 1943. Sec., Council on Medical Education and Hospitals, Dr. H. G. Weiskotten, 535 North Dearborn Street, Chicago.

NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL, May 2, page 102.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: Montgomery, June 16-18. Acting Sec., Dr. B. F. Austin, 519 Dexter Ave., Montgomery.

ARKANSAS: * *Medical.* Little Rock, June 4-5. Sec., Dr. D. L. Owens, Harrison. *Eclectic.* Little Rock, June 4-5. Sec., Dr. Clarence H. Young, 1415 Main St., Little Rock.

CALIFORNIA: *Written.* San Francisco, June 29-July 2. *Oral examination* (required when reciprocity application is based on a state certificate or license issued ten or more years before filing application in California), Los Angeles, May 20. Sec., Dr. Charles B. Pinkham, 1020 N St., Sacramento.

CONNECTICUT: * *Medical.* Hartford, July 14-15. *Endorsement.* Hartford, July 28. Sec. to the Board, Dr. Creighton Barker, 258 Church St., New Haven. *Homeopathic.* Derby, July 14-15. Sec., Dr. Joseph H. Evans, 1488 Chapel St., New Haven.

DELAWARE: Dover, July 14-16. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniel, 229 S. State St., Dover.

FLORIDA: * Jacksonville, June 22-23. Sec., Dr. William M. Rowlett, Box 786, Tampa.

GEORGIA: Atlanta, June. Sec., State Examining Boards, Mr. R. C. Coleman, 111 State Capitol, Atlanta.

HAWAII: Honolulu, July 13-16. Sec., Dr. James A. Morgan, 55 Young Bldg., Honolulu.

ILLINOIS: Chicago, June 23-25. Superintendent of Registration, Mr. Philip M. Harman, Department of Registration and Education, Springfield.

INDIANA: Indianapolis, June 16-18. Sec., Board of Registration and Examination, Dr. J. W. Bowers, 301 State House, Indianapolis.

IOWA: * Iowa City, May 11-13. Dir., Division of Licensure and Registration, Mr. H. W. Grefe, Capitol Bldg., Des Moines.

KANSAS: Kansas City, June 2-3. Sec., Board of Medical Registration and Examination, Dr. J. F. Hassig, 905 N. Seventh St., Kansas City.

KENTUCKY: Louisville, May 27-29. Sec., State Board of Health, Dr. A. T. McCormack, 620 S. Third St., Louisville.

MAINE: Augusta, July 7-8. Sec., Dr. Adam P. Leighton, 192 State St., Portland.

MARYLAND: *Medical.* Baltimore, June 9-12. Sec., Dr. John T. O'Mara, 1215 Cathedral St., Baltimore. *Homeopathic.* Baltimore, June 16-17. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MASSACHUSETTS: Boston, July 14-17. Sec., Dr. H. Q. Gallupe, 413-F State House, Boston.

MICHIGAN: * Ann Arbor and Detroit, June 3-5. Sec., Board of Registration in Medicine, Dr. J. Earl McIntyre, 202-4 Hollister Bldg., Lansing.

MINNESOTA: * Minneapolis, April 21-23. Sec., Dr. Julian F. Du Bois, 230 Lowry Medical Arts Bldg., St. Paul.

MISSISSIPPI: Jackson, June 24-25. Assistant Sec., State Board of Health, Dr. R. N. Whitfield, Jackson.

MISSOURI: St. Louis, June 4-6. Sec., Board of Health, Dr. James Stewart, State Capitol Bldg., Jefferson City.

NEW HAMPSHIRE: Concord, Sept. 10-11. Sec., Board of Registration in Medicine, Dr. T. P. Burroughs, State House, Concord.

NEW JERSEY: Trenton, June 16-17. Sec., Dr. Earl S. Hallinger, 28 W. State St., Trenton.

NEW YORK: Albany, Buffalo, New York and Syracuse, June 22-25. Chief, Bureau of Professional Examinations, Mr. Herbert J. Hamilton, 315 Education Bldg., Albany.

NORTH CAROLINA: Raleigh, June 15. Sec., Dr. W. D. James, Hamlet.

NORTH DAKOTA: Grand Forks, July 7-10. Sec., Dr. G. M. Williamson, 4½ S. Third St., Grand Forks.

OHIO: *Written.* Columbus, June 16-17. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus.

OKLAHOMA: * Oklahoma City, June 3-4. Sec., Dr. James D. Osborn Jr., Frederick.

OREGON: * Portland, July 22-24. Application must be on file not later than July 9. Exec. Sec., Miss Lorienne M. Conlee, 608 Failing Bldg., Portland.

PENNSYLVANIA: Philadelphia and Pittsburgh, July. Act. Sec., Bureau of Professional Licensing, Mrs. Marguerite G. Steiner, 358 Education Bldg., Harrisburg.

SOUTH CAROLINA: Columbia: June 22-24. Sec., Dr. A. Earle Boozer, 505 Saluda Ave., Columbia.

SOUTH DAKOTA: * Pierre, July 21-22. Dir., Medical Licensure, Dr. J. F. D. Cook, State Board of Health, Pierre.

TENNESSEE: Knoxville, Memphis and Nashville, June 17-20. Sec., Dr. H. W. Qualls, 130 Madison Ave., Memphis.

TEXAS: Dallas, June 4-6. Sec., Dr. T. J. Crowe, 918-20 Texas Bank Bldg., Dallas.

UTAH: Salt Lake City, June 29-30. Assistant Dir., Department of Registration, Mr. G. V. Billings, 324 State Capitol Bldg., Salt Lake City.

VERMONT: Burlington, June 16-18. Sec., Board of Medical Registration, Dr. F. J. Lawliss, Richford.

VIRGINIA: Richmond, June 17-20. Sec., Dr. J. W. Preston, 30½ Franklin Rd., Roanoke.

WEST VIRGINIA: Charleston, July 6-8. Commissioner, Public Health Council, Dr. C. F. McClintic, State Capitol, Charleston.

WISCONSIN: * Milwaukee, June 30-July 3. Sec., Dr. H. W. Shutter, 425 E. Wisconsin Ave., Milwaukee.

WYOMING: Cheyenne, June 1-2. Sec., Dr. M. C. Keith, Capitol Bldg., Cheyenne.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ARIZONA: Tucson, June 16. Sec., Mr. Franklin E. Roach, Science Hall, University of Arizona, Tucson.

ARKANSAS: Little Rock, May 23. Sec., Mr. Louis E. Gebauer, 701 Main St., Little Rock.

CONNECTICUT: June 13. Address State Board of Healing Arts, 1945 Yale Station, New Haven.

FLORIDA: Gainesville, June 8. Applications must be on file not later than May 23. Sec., Professor J. F. Conn, John B. Stetson University, De Land.

MICHIGAN: Ann Arbor and Detroit, June 12-13. Sec., Miss Eloise LeBeau, 101 N. Walnut St., Lansing.

NEBRASKA: Omaha, June 8-10. Dir., Bureau of Examining Boards, Mrs. Jeannette Crawford, 1009 State Capitol Bldg., Lincoln.

NEW MEXICO: Springer, June 12. Sec., Miss Pia Joerger, State Capitol, Santa Fe.

OKLAHOMA: Oklahoma City, May 15. Sec., Dr. Oscar C. Newman, Shattuck.

OREGON: Corvallis, July 11. Application must be on file not later than June 24. Sec., Mr. Charles D. Byrne, University of Oregon, Eugene.

RHODE ISLAND: Providence, May 20. Chief, Division of Examiners, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

SOUTH DAKOTA: Vermillion, June 5-6. Sec., Dr. G. M. Evans, Yankton.

WISCONSIN: Milwaukee, June 6. Sec., Prof. Robert N. Bauer, 3414 W. Wisconsin Ave., Milwaukee.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Workmen's Compensation Acts: Right to Require Claimant to Submit to Physical Examination.—The workmen's compensation act of Virginia provides that a child over the age of 18 is presumed to be totally dependent if physically or mentally incapacitated from earning a livelihood. After her father had died as the result of an accident during his employment with the defendant employer, the claimant, a 26 year old unmarried daughter of the deceased, filed a petition for compensation under that provision. Prior to a hearing, the claimant was ordered by the industrial commission to submit to a physical examination by two physicians selected by the defendant's insurance carrier, also a defendant in this proceeding. The examination was made over the objections of the claimant. At the hearing these physicians testified that the claimant's heart and lungs were normal and that she was able to do ordinary work, such as clerking in a store. Such work, they said, would be beneficial to her. The claimant called as witnesses two physicians who testified that her blood pressure was low and her pulse rate high, that her heart showed signs of muscular weakness and enlargement and that her lungs showed areas of calcification. The claimant was, in their opinion, physically unable to work at any gainful occupation. From an order denying compensation, the claimant appealed to the Supreme Court of Appeals of Virginia.

The claimant contended that the commission had no authority to compel her to submit to a physical examination and that the testimony of the insurer's physicians was therefore inadmissible. The only provision in the workmen's compensation act having anything to do with physical examinations is section 64. It provides that the commission or any member thereof may, on the application of either party or on its own motion, appoint a disinterested and duly qualified physician to make any necessary medical examination of an employee and that the physician so appointed may testify as to his findings. While the claimant was not an employee within the meaning of this section, the court indicated that it is clearly the modern trend for a court to require a plaintiff in an action to recover damages for personal injuries to submit before trial to a reasonable physical examination by competent physicians when such examination is necessary. The right so to order is within the inherent discretionary power of a court in order to prevent the perpetration of a fraud by feigned personal injuries. But, said the court, the better rule is that unless consent is given to the examination the court should designate an impartial and disinterested physician, not one selected by the defendant. Here the commission compelled the claimant to submit to a physical examination by physicians chosen by the defendant's insurance carrier. In doing so, it erred. Their testimony excluded, the evidence was uncontradicted that the claimant was physically incapable of earning a livelihood. The court therefore reversed the order denying compensation and remanded the cause to the commission for the awarding of proper compensation.—*Basham v. R. H. Lowe, Inc., 11 S. E. (2d) 638 (Va., 1940).*

Workmen's Compensation Acts: Death from Unintentional Poisoning Following Industrial Injury.—In November 1935 an employee while in the employ of the defendant sustained an industrial injury which necessitated the amputation of the terminal phalanx of the great toe six months later. Postoperative treatment continued until June 16, 1936, when he was discharged by his physician. A few days thereafter the employee experienced pain in his right foot and leg and during the day he took sedative tablets which the physician had prescribed. The pain continued during the night and through mistake a mercury bichloride tablet was taken instead of a sedative tablet. Death followed within five days and was concededly due to mercury bichloride poisoning. His widow, the claimant, filed a petition for compensation under the New York workmen's compensation act. An award was eventually granted by the state industrial board which was affirmed by the supreme court, appellate division (11 N. Y. S. (2d) 849; 19 N. Y. S. (2d) 901; J. A. M. A. **115**:156 [July 13] 1940), on the finding, in effect, that the industrial injury caused the pain and that the attempt to alleviate the pain resulted in the mistaken choice of tablets and ultimate death. The insurance carrier and the employer appealed to the Court of Appeals of New York.

The Court of Appeals could find no evidence that the accident and the amputation which followed were sufficient to derange the employee's mind or affect his eyesight. He had suffered pain throughout the day preceding his fatal mistake, but proof of pain alone does not permit the implication that such a derangement had taken place as would have caused him to make the mistake which took his life. It was not disputed, the court said, that an independent act by the employee intervened to cause his death. His fatal act of taking internally a mercury bichloride tablet, instead of the mild sedative prescribed for his use, did not relate itself to the accident which he sustained in November 1935. Following such independent act there remained intact no chain of causation between the accidental injury and the fatal consequences of the mistake. Finding no evidence that the employee's death resulted from an accidental injury arising out of and in the course of employment, the Court of Appeals reversed the judgment of the lower court and vacated the award in favor of the claimant.—*Brown v. New York State Training School for Girls, 32 N. E. (2d) 783 (N. Y., 1941).*

Compensation of Physician: Liability of Employer and Insurance Carrier in Common Law Action to Recover for Medical Services Rendered Employee.—The plaintiff, a physician, brought a common law action of assumpsit against the defendant employer and his insurer. He alleged that one Marks was injured in the course of his employment with the defendant employer and retained him to treat his injuries; that a few days subsequently the defendant employer and his insurer, the other defendant in the action, authorized him to continue his care and treatment of the employee and promised to compensate him adequately for all treatment and care he might render, and that, relying on such promise, he performed certain services of a stated value for which the defendants had refused to pay. The defendants filed a pleading which, in the opinion of the Supreme Court of Rhode Island, in effect, was either a plea in bar or amounted in substance to a demurrer, alleging that the action should be abated because the physician was attempting to enforce at common law a claim that properly could be enforced only under the workmen's compensation act of Rhode Island. The trial court sustained the defendants' plea and abated the action, and the physician appealed to the Supreme Court of Rhode Island.

In support of their contention that recovery could be had against them only under the workmen's compensation act, the defendants relied on *Henry* v. *American Enamel Co.*, 48 R. I. 113, 136 A. 3. In our opinion, said the Supreme Court, the defendants' contention is not sound. The Henry case cited by them is not applicable to the facts and circumstances of this case as set out in the plaintiff's declaration. In the Henry case the court held, in substance, among other things, that the workmen's compensation act permitted an injured employee to select his own physician; that by force of that statute alone, and entirely apart from any act or consent of the employer,

the latter became liable to a physician for his fees up to a specified amount under certain conditions and limitations; that the workmen's compensation act created a new right in favor of a physician against an employer, a right having no existence or enforceability apart from the act which provided for a method of enforcement, and that the act did not give a physician an action equivalent to assumpsit against the employer of the injured person. The Henry case, continued the court, thus clearly defined the nature and scope of the right of a physician under the workmen's compensation act to recover his fees from the employer of an injured person who was treated by that physician. That case, however, did not purport to deal with or to limit any other rights which a physician might properly have to collect his fees from an injured person's employer or from any one else by virtue of an independent agreement, entirely apart from the right created by the workmen's compensation act. The act gave to the physician an added remedy to be enforced in a certain manner but did not make that remedy exclusive. There is, therefore, nothing to prevent a physician, if he sees fit, from bringing an ordinary action of assumpsit for the collection of his fees against his patient's employer or another, entirely apart from the right created under the act, provided he can allege in his declaration facts necessary to support such an action.

In our opinion, said the court, an examination of the declaration as a whole in this case shows clearly that the physician is attempting to bring an ordinary action of assumpsit, entirely apart from the right created under the workmen's compensation act. The gist of the declaration is the allegation that the defendants authorized the physician to continue his treatment of the patient and promised that they would adequately compensate him for such services. This claim is plainly entirely independent of any right created in the plaintiff's favor by the workmen's compensation act, a right requiring no promise for its support but being merely an obligation of the employer and his insurer existing by force of the workmen's compensation act itself.

The same court accordingly concluded that it was error for the trial court to abate the action and remanded the case to the trial court for further proceedings.—*Migliaccio v. United Wire & Supply Corporation, 23 A. (2d) 893 (R. I., 1942).*

Award Under Federal Longshoremen's and Harbor Workers' Compensation Act as Bar to Action for Damages for Alleged Aggravation of Industrial Injuries by Malpractice of Attending Physicians.—A workman, says the Supreme Court of Washington, who has been awarded compensation under the Federal Longshoremen's and Harbor Workers' Compensation Act for injuries sustained in an industrial accident within the coverage of that act and for the aggravation of those injuries allegedly resulting from the negligence of his attending physicians cannot thereafter maintain an action against the attending physicians for damages resulting from their alleged malpractice.—*Anderson v. Allison, 122 P. (2d) 484 (Wash., 1942).*

Society Proceedings

COMING MEETINGS

American Medical Association, Atlantic City, N. J., June 8-12. Dr. Olin West, 535 North Dearborn Street, Chicago, Secretary.

American Association for the Study of Allergy, Atlantic City, N. J., June 8-9. Dr. J. Harvey Black, 1405 Medical Arts Bldg., Dallas, Texas, Secretary.

American Association for the Study of Goiter, Atlanta, Ga., June 1-3. Dr. Thomas C. Davison, 478 Peachtree St. N.E., Atlanta, Ga., Secretary.

American Association for the Surgery of Trauma, Boston, June 4-6. Dr. Gordon M. Morrison, 520 Commonwealth Ave., Boston, Secretary.

American Association of Genito-Urinary Surgeons, Hershey, Pa., May 27-29. Dr. Charles C. Higgins, 2020 East 93d St., Cleveland, Secretary.

American Association of Oral and Plastic Surgeons, New York, May 28-30. Dr. Frederick A. Figi, 102 Second Avenue S.W., Rochester, Minn., Secretary.

American Association on Mental Deficiency, Boston, May 13-16. Dr. Neil A. Dayton, 100 Nashua St., Boston, Secretary.

American Broncho-Esophagological Association, Atlantic City, N. J., June 8-9. Dr. Paul H. Holinger, 700 North Michigan Blvd., Chicago, Secretary.

American College of Chest Physicians, Atlantic City, N. J., June 6-8. Dr. Paul H. Holinger, 500 North Dearborn St., Chicago, Secretary.

American Dermatological Association, Hot Springs, Va., May 31-June 4. Dr. Harry R. Foerster, 208 East Wisconsin Ave., Milwaukee, Secretary.

American Diabetes Association, Atlantic City, N. J., June 7. Dr. Cecil Striker, 630 Vine Street, Cincinnati, Secretary.

American Gastro-Enterological Association, Atlantic City, N. J., June 8-9. Dr. J. Arnold Bargen, 102 Second Ave. S.W., Rochester, Minn., Secretary.

American Gynecological Society, Skytop, Pa., June 15-17. Dr. Howard C. Taylor Jr., 842 Park Ave., New York, Secretary.

American Heart Association, Atlantic City, N. J., June 5-6. Dr. Howard B. Sprague, 50 West 50th St., New York, Secretary.

American Human Serum Association, Atlantic City, N. J., June 8. Dr. Maurice Hardgrove, 3321 North Maryland Ave., Milwaukee, Secretary.

American Laryngological Association, Atlantic City, N. J., May 25-27. Dr. Charles J. Imperatori, 108 East 38th St., New York, Secretary.

American Laryngological, Rhinological and Otological Society, Atlantic City, N. J., June 1-3. Dr. C. Stewart Nash, 277 Alexander St., Rochester, N. Y., Secretary.

American Medical Women's Association, Atlantic City, N. J., June 6-7. Dr. Ada Chree Reid, 102 East 22d St., New York, Secretary.

American Neurological Association, Chicago, June 4-6. Dr. Henry A. Riley, 117 East 72d St., New York, Secretary.

American Ophthalmological Society, Hot Springs, Va., June 1-3. Dr. Eugene M. Blake, 303 Whitney Ave., New Haven, Conn., Secretary.

American Orthopedic Association, Baltimore, June 3-6. Dr. Charles W. Peabody, 474 Fisher Bldg., Detroit, Secretary.

American Otological Society, Atlantic City, N. J., May 28-29. Dr. Isidore Friesner, 101 East 73d St., New York, Secretary.

American Physiotherapy Association, Lake Geneva, Wis., June 28-July 3. Miss Evelyn Anderson, Stanford University, Calif., Secretary.

American Proctologic Society, Atlantic City, N. J., June 7. Dr. William H. Daniel, 1930 Wilshire Blvd., Los Angeles, Secretary.

American Psychiatric Association, Boston, May 18-22. Dr. Winfred Overholser, St. Elizabeths Hospital, Washington, D. C., Secretary.

American Radium Society, Atlantic City, N. J., June 8-9. Dr. Axel N. Arneson, 4952 Maryland Ave., St. Louis, Secretary.

American Society of Clinical Pathologists, Philadelphia, June 5-7. Dr. Alfred S. Giordano, 531 North Main St., South Bend, Ind., Secretary.

American Therapeutic Society, Atlantic City, N. J., June 5-6. Dr. Oscar B. Hunter, 1835 Eye St. N.W., Washington, D. C., Secretary.

American Urological Association, New York, June 1-4. Dr. Clyde L. Deming, 789 Howard Ave., New Haven, Conn., Secretary.

Arizona State Medical Association, Prescott, May 25-30. Dr. W. Warner Watkins, 15 East Monroe St., Phoenix, Secretary.

Association for the Study of Internal Secretions, Atlantic City, N. J., June 8-9. Dr. Henry H. Turner, 1200 North Walker St., Oklahoma City, Secretary.

Connecticut State Medical Society, Middletown, June 3-4. Dr. Creighton Barker, 258 Church St., New Haven, Secretary.

Illinois State Medical Society, Springfield, May 19-21. Dr. Harold M. Camp, 224 South Main St., Monmouth, Secretary.

Kansas Medical Society, Wichita, May 11-14. Mr. C. G. Munns, 112 West Sixth St., Topeka, Executive Secretary.

Maine Medical Association, Poland, June 21-23. Dr. Frederick R. Carter, 142 High Street, Portland, Secretary.

Massachusetts Medical Society, Boston, May 26-27. Dr. Michael A. Tighe, 8 Fenway, Boston, Secretary.

Minnesota State Medical Association, Duluth, June 28-July 1. Dr. B. B. Souster, 493 Lowry Medical Arts Bldg., St. Paul, Secretary.

Mississippi State Medical Association, Jackson, May 12-14. Dr. T. M. Dye, P. O. Box 295, Clarksdale, Secretary.

National Gastroenterological Association, New York, June 3-5. Dr. G. Randolph Manning, 1819 Broadway, New York, Secretary.

New Hampshire Medical Society, Manchester, May 12-13. Dr. Carleton R. Metcalf, 5 South State St., Concord, Secretary.

New Mexico Medical Society, Santa Fe, June 25-28. Dr. L. B. Cohenour, 221 W. Central Avenue, Albuquerque, Secretary.

New York State Association of Public Health Laboratories, Cooperstown, May 18. Miss Mary B. Kirkbride, New Scotland Ave., Albany, Secretary.

North Carolina, Medical Society of the State of, Charlotte, May 11-13. Dr. Roscoe D. McMillan, P. O. Box 232, Red Springs, Secretary.

North Dakota State Medical Association, Jamestown, May 18-20. Dr. L. W. Larson, 221 Fifth St., Bismarck, Secretary.

Pacific Coast Oto-Ophthalmological Society, Portland, Ore., May 11-14. Dr. C. Allen Dickey, 450 Sutter St., San Francisco, Secretary.

Pacific Northwest Medical Association, Portland, Ore., June 17-20. Dr. C. W. Countryman, 407 Riverside Ave., Spokane, Secretary.

Rhode Island Medical Society, Providence, June 3-4. Dr. William P. Buffum, 122 Waterman St., Providence, Secretary.

Society of Surgeons of New Jersey, Montclair, May 27. Dr. Walter B. Mount, 21 Plymouth Street, Montclair, Secretary.

South Carolina Medical Association, Myrtle Beach, May 19-21. Dr. Julian P. Price, 105 West Cheves St., Florence, Secretary.

South Dakota State Medical Association, Sioux Falls, May 13-15. Dr. Clarence E. Sherwood, 107½ Egan Avenue South, Madison, Secretary.

Texas, State Medical Association of, Houston, May 11-14. Dr. Holman Taylor. 1404 West El Paso St., Fort Worth, Secretary.

Current Medical Literature

AMERICAN

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Titles marked with an asterisk (*) are abstracted below.

American Journal of Clinical Pathology, Baltimore

12:73-128 (Feb.) 1942

Effect of Paraffin Hydrocarbons on Tuberculoallergy and Tuberculoimmunity Produced by Tubercle Bacilli. H. J. Corper and M. L. Cohn, Denver.—p. 73.

*Histoplasmosis "Darling." T. L. Ramsey and A. A. Applebaum, Toledo, Ohio.—p. 85.

Capillary-Venous Differences in Blood Glucose Values During One Hour, Two Dose Glucose Tolerance Test (Exton-Rose Procedure). P. H. Langner Jr. and H. L. Fies, Philadelphia.—p. 95.

Xanthoproteic Reaction and Phenol Content of Plasma in Patients with Urea Retention. R. S. Hubbard, F. E. Kenny and J. F. Mezen, Buffalo.—p. 103.

Technic of Kolmer Complement Fixation Tests for Syphilis Employing One-Fifth Amounts of Reagents. J. A. Kolmer, with technical assistance of Elsa R. Lynch, Philadelphia.—p. 109.

Nodular Tuberculosis of Liver and Spleen: Case Report. J. E. Welker and J. H. Hill, Kansas City, Mo.—p. 116.

Histoplasmosis.—Ramsey and Applebaum report a case of histoplasmosis with necropsy. The patient had lived all her life in Michigan and had never visited or lived in the tropics. The organic changes were principally hyperplasia of the cells of the reticuloendothelial system with infection of these cells by the fungous parasite, particularly in the spleen, liver, lymph nodes, lungs and bone marrow. The ulceration in the intestinal tract was probably caused by infection of the lymphoid tissues and reticulum cells in the submucosa. Clinically the disease may suggest Banti's disease, Gaucher's disease, obscure malignant conditions, tuberculosis, undulant fever in the early stages and primary dyscrasias of the blood. A definite diagnosis of histoplasmosis can be made only by isolating the fungus in the tissues of the body or in cultures of material from these tissues. To date there have been no instances of cure and no satisfactory treatment.

American Journal of Diseases of Children, Chicago

63:217-432 (Feb.) 1942

Bronchoscopic Aspects of Asthma in Children. Emily L. Van Loon and S. Diamond, Philadelphia.—p. 217.

*Combined Immunization of Infants Against Diphtheria, Tetanus and Whooping Cough. J. H. Lapin, New York.—p. 225.

Obesity in Childhood: Psychologic Studies. I. P. Bronstein, S. Wexler, A. W. Brown and L. J. Halpern, Chicago.—p. 238.

*Essential Fructosuria: Its Pathophysiology. B. Sachs, L. Sternfeld and G. Kraus, Brooklyn.—p. 252.

*Creatine Metabolism in Hypothyroid Infants and Children: Further Observations. H. G. Poncher, I. P. Bronstein, Helen Woodward Wade and Jeannette C. Ricewasser, Chicago.—p. 270.

*Nonobstructive Hydrocephalus: Treatment by Endoscopic Cauterization of Choroid Plexuses. J. E. Scarff, New York.—p. 297.

Nutritional Requirements of Children: Résumé. W. J. Dann and W. C. Davison, Durham, N. C.—p. 366.

Syphilitic Aortitis of Congenital Origin in Young Children: Review of Literature and Report of Case. J. Yampolsky and C. C. Powel, with pathologic assistance of R. Mosteller, Atlanta, Ga.—p. 371.

Immunization of Infants.—Lapin discusses the immunity responses of 78 infants aged 6 to 9 months who were given five monthly injections of a combination of clear diphtheria toxoid, alum precipitated tetanus toxoid, whooping cough vaccine and whooping cough toxin. Immunization to diphtheria resulted in all the subjects, 97 per cent showing more than $\frac{1}{250}$ unit of antitoxin per cubic centimeter of blood and 91 per cent more than $\frac{1}{10}$ unit per cubic centimeter. In 93.2 per cent the average tetanus antitoxic level rose to 0.5 unit; three months after immunization the antitoxic level was greater than that attained by the usual prophylactic injection of tetanus antitoxin. Evidence is cited which shows that the 6.8 per cent whose titer was below this level three months after immunization have a sound "basal immunity" and that on exposure they will respond to a boosting dose of antitoxin with a safe antitoxic level. The whooping cough immunization resulted in positive reactions to agglutination tests for all the subjects, complement fixation of 4 plus for 87.2 per cent and positive for 97.4 per cent, and a positive mouse protection titer for 87.5 per cent.

Essential Fructosuria.—Sachs and his associates report the occurrence of essential fructosuria in 2 brothers and present some experimental studies which attempt to explain the mechanism of the condition. A hypothesis is presented that the mechanism is a failure of part of the ingested fructose to be broken down to lactic acid. The authors further speculate that in normal human beings about 80 per cent of ingested fructose is converted to glycogen, the remainder being broken down to lactic acid. In their patients 10 to 20 per cent of the fructose ingested was excreted as such in the urine instead of being metabolized. The hypothesis would seem to account for the failure of a normal increase in the concentration of lactic acid in the blood and a rise in the respiratory quotient. The abnormality may lie in the failure or lack of some as yet undetermined local specific enzymatic action. The work of Sterkin and Vengerova and of Rynbergen, Chambers and Blatherwick adds validity to this hypothesis.

Creatine Metabolism in Hypothyroidism.—Poncher and his associates state that their observations on 6 hypothyroid girls, aged 8 months to 13 years, throughout a period of continuous therapy with thyroid substantiate their earlier contention that the creatinuria response to the administration of thyroid is of diagnostic value along with clinical observations. The basal metabolic rate as ordinarily determined is an unreliable criterion in young and in hypothyroid children. The cholesterol value of the blood and roentgenograms are not always informative. Only 2 of the 6 subjects exhibited an elevated level of cholesterol, and because of previous treatment only 2 exhibited any delay in the appearance of the carpal centers at the wrist. No one chemical test is a measure of thyroid activity for all hypothyroid children. However, it is more convenient to carry out studies of the serum cholesterol than of the urinary creatine, but cholesterol determinations are no more informative than carefully controlled creatine studies. The determination of the degree of creatinuria in the 6 hypothyroid children was a valuable aid in the diagnosis. The amount of creatine excreted by a hypothyroid child might be used in gaging the effect of thyroid therapy. The level of urinary creatine serves only as an adjunct to the structural and functional observations on which the diagnosis of hypothyroidism is based. The establishment of a normal type of creatine metabolism was followed by clinical improvement in the 6 subjects. Basal metabolic rates in 3 of the hypothyroid children varied widely, depending on the standard of reference used. The upward trend in the rate as affected by treatment is considered far more significant than the actual numerical values. The rate of energy exchange in the 6 children was not as closely related to the urinary preformed creatinine as it was to height, weight and surface area.

Nonobstructive Hydrocephalus.—Scarff discusses his experiences with 20 patients during the last seven years and summarizes results obtained in the treatment of communicating hydrocephalus by endoscopic cauterization of the choroid plexus with the ventriculoscope. Forty-eight cauterizations (on one side of the plexus) were performed. There were 3 operative deaths, a mortality of 15 per cent and an operative mortality of 6 per cent. No deaths have occurred during the last four years. Of the children who survived the operation 7 were discharged from the hospital, but the result of their treatment was generally unsatisfactory. The result in the remaining 10 was satisfactory and a lasting reduction of intracranial tension was attained. One of these 10 died after five years; the other 9 are still living after six months to more than six years. Four of the 9 surviving children have an essentially normal mentality, 3 are moderately retarded and 2 are decidedly retarded. One of the successfully treated patients had postmeningitic hydrocephalus. He apparently is the first patient of

this sort to be the subject of a report. A second patient, who was similarly treated, is still living, although the result of treatment is not considered satisfactory. Acute intraventricular hypotension as a postoperative complication, described for the first time, occurred in 3 children. The importance of early diagnosis, careful choice of patients, radical operation, close follow-up observation and early reoperation if pressure returns is stressed. The results warrant a wider use of the method. A lower mortality and a higher average mentality in patients so treated may be expected in the future.

American Journal of Surgery, New York

55:189-440 (Feb.) 1942

Fractures of Elbow. I. Cohn, New Orleans.—p. 210.
Evaluation of "Hanging Cast" as Method of Treating Fractures of Humerus. J. M. Winfield, H. Miller and A. D. LaFerte, Detroit. —p. 228.
Injuries to Acromioclavicular Joint: Plea for Conservative Treatment. A. Thorndike Jr. and T. B. Quigley, Boston.—p. 250.
Complicating Factors in Treatment of Injuries to Menisci of Knee Joint. C. R. Murray, New York.—p. 262.
Regeneration in Ulnar, Median and Radial Nerves. H. C. Marble, E. Hamlin Jr. and A. L. Watkins, Boston.—p. 274.
Spiral and Oblique Fractures of Tibia: Method of Treatment. C. Mathewson Jr., San Francisco.—p. 295.
Convalescent Care of Patients with Fractures. R. H. Kennedy, New York.—p. 309.
Spinal Cord Injuries: Analysis of Six Cases Showing Subarachnoid Block. F. H. Mayfield and G. M. Cazan, Cincinnati.—p. 317.
Method for Closing Traumatic Defect of Finger Tip. R. A. Jones, San Francisco.—p. 326.
*Treatment of Fractured Patella by Excision. R. P. Dobbie and S. Ryerson, Buffalo.—p. 339.
*Local Therapeutic Effect of Sulfathiazole. G. C. Weil, D. W. Whitaker and H. W. Rusbridge, Pittsburgh.—p. 374.
Treatment of Fresh Traumatic Wounds. J. D. Bisgard and C. P. Baker, Omaha.—p. 386.
Traumatic Abdominal Surgical Emergencies. E. P. Palmer, Phoenix, Ariz.—p. 397.
*Cortical Extract in Treatment of Shock: Preliminary Report. L. S. Helfrich, W. H. Cassels and W. H. Cole, Chicago.—p. 410.

Fractured Patella.—Dobbie and Ryerson were prompted by the good results obtained in 1937 by Brooke of England to excise completely a fractured patella in 21 patients. A patient who required an open surgical procedure was treated by a complete excision of the fragments. All the fractures but one, which was compound, were simple. The average postoperative hospitalization period was twenty-two and seven-tenths days. The average period for 8 private patients was seventeen and one-half days. Patients without complications were able to walk well without dressings, aid or discomfort at the end of the second week. As no physical therapy other than active use is prescribed there is no reason to keep such patients in the hospital any longer. With progressively increasing activity, at the end of six to eight weeks the patient is able to walk long distances and to walk up stairs. No functional impairment remains at the end of four months. The end result was considered excellent only when the function of the limb and knee joint was normal. Of the 21 patients, 1 died in the seventh postoperative week from pulmonary embolism, for 2 sufficient time has not elapsed to expect or to warrant a complete return of function, 2 failed to report for the final check up and in 16 an excellent result was demonstrated from three to forty-one months postoperatively. These 16 have returned to their usual work as laborers or housewives. The range and rapidity of movement and the power of the knee joint from which the patella was removed are in no way inferior to that displayed in the opposite, intact, limb.

Effect of Sulfathiazole.—Weil and his associates report the results obtained with the local application of sulfathiazole in 31 fresh compound wounds, 58 compound fractures and 22 simple fractures requiring operation. Their usual technic of handling wounds and compound fractures was changed in only two respects: (1) application of sulfathiazole crystals directly to the wounds and (2) closure without drainage. An operative procedure was found necessary in 89.6 per cent of the compound fractures. Cultures of material from the wounds showed pathogenic organisms in 50 per cent. Almost all of the cultures were taken within six hours of injury. Infection after sulfathiazole had been applied developed in 6 compound fractures. However, in 2 of these bacteria were found in completely necrotic tissue, and in 1 case in which a fracture of the skull was compounded through the mastoid and middle ear local application of the drug was impossible. This brings the incidence of infection to 5.4 per cent. Of the 3 remaining cases, the drug in 1 was applied locally at the time of injury, the wound in 1 continued to discharge a purulent exudate for several weeks in spite of repeated local treatment, and gas gangrene developed in 1 despite prophylactic use of the drug. It is the authors' belief that the administration of large doses of sulfathiazole locally and orally within three or four hours of injury, continued for nine to fourteen days, will in many cases prevent gas gangrene. Sulfathiazole has not been very effective in the treatment of active gas gangrene. The wounds in the other 52 cases healed without infection in a manner approaching primary union save for the occasional discharge of a clear, nonpurulent, serosanguineous exudate. A reparative operation was necessary in 67.8 per cent of the 31 cases in which wounds of the soft tissue occurred. Healing comparable to primary union occurred in 25, 5 showed a moderate delay of healing because of a collection of serum within the wounds or of loss of soft tissue, and a superficial but persistent infection developed in 1, which responded after six weeks of local therapy. Two deaths occurred, but they were due to complicating injuries. The healing of the wound in 12 cases was delayed, and delayed union of fractures occurred in 2. The authors cannot definitely ascribe the delay of healing and union to a toxic reaction to the drug. Among the 22 simple fractures requiring an operation because of gross displacement of the fragments there were no infections. A delay in callus formation occurred in 3, and it too could not definitely be attributed to the drug. None of these patients died.

Treatment of Shock.—Helfrich and his co-workers gaged the efficacy of cortical extract in the prophylactic treatment of experimental shock in animals and in human beings undergoing major operations of a magnitude apt to produce shock. When cortical extract was given an hour or two before shock was produced the average drop in systolic blood pressure of the animals after forty minutes of intestinal massage was only 19.5 mm., contrasted with 35.3 mm. in animals not receiving extract prophylactically. In 15 human beings undergoing major operations of unusual duration and severity and given cortical extract prophylactically the pulse rate averaged 8 beats per minute slower and the systolic blood pressure 12 mm. higher than in 15 similar patients undergoing comparable operations but not given extract. The observations show that the extract was more effective if given prophylactically than if given after shock had developed.

Annals of Internal Medicine, Lancaster, Pa.

16:1-220 (Jan.) 1942

*Antibody Response of Patients with Pneumococcic Pneumonia Treated with Sulfadiazine and Sulfathiazole. M. Finland, E. Strauss and O. L. Peterson, Boston.—p. 1.
*Further Studies on Recurrences of Pneumococcic Pneumonia, with Special Reference to Effect of Specific Treatment. E. Strauss and M. Finland, Boston.—p. 17.
Treatment of Neuroses by Class Technic. S. B. Hadden, Philadelphia. —p. 33.
Role of Vertebral Veins in Metastatic Processes. O. V. Batson, Philadelphia.—p. 38.
Study of Hereditary Nature of Gout: Report of Two Families. C. J. Smyth and R. H. Freyberg, Ann Arbor, Mich.—p. 46.
*Chemotherapy of Pneumonias and Immunity Reactions. J. G. M. Bullowa, N. H. Shackman and D. Stats, New York.—p. 57.
Protein Derivatives as Factors in Allergy. R. A. Cooke, New York. —p. 71.
*Treatment of Acute Carbon Tetrachloride Poisoning: Report of Two Cases. B. J. Allison, Long Island, N. Y.—p. 81.
Theory Concerning Manner in Which Stomach Empties Itself. W. T. Gibb Jr., New York.—p. 94.
Pathologic Physiology of Early Manifestations of Left Ventricular Failure. C. S. Burwell, Boston.—p. 104.
Cruveilhier-Baumgarten Syndrome: Review of Literature and Report of Two Additional Cases. E. L. Armstrong, W. L. Adams Jr., L. J. Tragerman and E. W. Townsend, Los Angeles.—p. 113.

Sulfadiazine and Sulfathiazole in Pneumonia.—Finland and his co-workers determined the antibody response in the serum of a group of 46 patients treated with sulfathiazole and another group of 48 treated with sulfadiazine. Serum was taken from these patients during and after chemotherapy, and the agglutinins and mouse protective antibodies in it were tested

against the homologous type of pneumococcus and for precipitins against the corresponding type specific polysaccharide. To none of the patients was antipneumococcus serum or vaccine administered. In almost all the patients of the two groups mouse protective antibodies developed at about the time of essential clinical recovery (the day of crisis) or later. In an occasional specimen of serum these antibodies were present as early as the fourth day of the disease, but usually they were not demonstrated until the sixth day or later. The titers of most patients increased gradually over the course of a few days, while in some they rose more rapidly. Agglutinins appeared in the serum either at the same time as the mouse protective antibodies or later. Agglutinins were never demonstrated in the absence of antibody protection, although the reverse was frequent. In general, the results of protection and agglutination tests were similar to those previously obtained in patients treated with sulfapyridine. The precipitin test with the homologous type specific polysaccharide was the least sensitive of the three tests used. Pneumococci, that is multiple organisms, of other types than I to V, VIII, XIV or XVIII, were identified in the sputum of 9 patients. In 3 of these patients agglutinins for the second type of pneumococcus were and in 6 they were not demonstrated. In addition to the 94 patients treated with sulfadiazine or sulfathiazole, 14 patients with type I, II, V or VIII pneumococcus pneumonia were given antipneumococcus serum after one to five days of treatment with sulfadiazine or sulfathiazole. Antibodies were demonstrated in the blood of only 3 of them before the first dose of antipneumococcus serum was given. However, high titers of agglutinins, precipitins and mouse protection for the homologous pneumococcus were found in the blood of the 14 patients after the antiserum was given.

Recurrence of Pneumococcic Pneumonia.—Strauss and Finland discuss the changes in the incidence or character of one hundred and ninety-one recurrences of pneumonia among 168 patients treated at the Boston City Hospital. All the patients were more than 12 years of age, 48 were female and all but 12 were white, and the interval between the essential recovery from one attack and the onset of another varied from seven days to eighteen years. Multiple types of pneumococci were isolated during one or more attacks from 20 patients. In the one hundred and ninety-one recurrences the blood cultures of 29 patients showed pneumococci. There were 21 deaths during the one hundred and ninety-one recurrent attacks, a mortality of 11 per cent. The patients were specifically treated during one hundred and twelve recurrences with antipneumococcus serums, sulfonamide drugs (sulfapyridine, sulfathiazole and sulfadiazine) or a combination of the two. The mortality in the specifically treated group was 11.6 per cent. The mortality among the patients who had seventy-nine recurrent attacks and who were given no specific treatment was 10.1 per cent. Eight of the 29 patients who had bacteremia during a recurrent attack died; 4 of the 23 given specific therapy died, and 3 of the 5 patients not treated specifically. Five patients died of complicating diseases independent of the pneumonia. The recurrent attacks of nearly three fifths of the 48 patients who had no specific therapy for the first and specific therapy for the recurrent pneumonia were shorter than they had been in the initial infection. Among three fifths of the patients who had the benefit of specific therapy during both attacks the duration of acute illness was the same in both the initial and the recurrent attack. Of the patients who had no specific therapy in either attack, in more than 80 per cent the duration of the recurrence was the same as or shorter than that in the initial attack. A study of the frequency of recurrence as related to the type of therapy and the immunity reactions indicates that patients may have two or more attacks of pneumonia with the same type of pneumococcus, regardless of whether they receive specific or nonspecific treatment during the first attack and regardless of whether antibodies for the homologous type develop after the first attack. Recurrences ensued even though homologous antibodies were present at the time of the recurrent attack. It is impossible to correlate the immunity state with the likelihood of recurrence. Such correlation must await the accumulation of a larger body of data than is available at present.

Chemotherapy of Pneumonia and Immunity Reaction.—Bullowa and his collaborators believe that the capacity to overcome infection must be considered when the effect of different treatments is compared. Patients who recover from pneumonia without specific therapy do so by reason of their immunity response, which destroys the invading bacteria, and such patients as a rule exhibit acquired immunity to the invading organism. The response of the body to invasion by the pneumococcus is discussed and the authors show that there are immunity responses which contribute to recovery when the sulfonamide drugs are used. If the sulfonamide drugs are administered early in the disease, the pneumococci are attenuated or killed by them. Immunity is established about the same time as if the patient had had a mild infection and had recovered spontaneously. Although in most young patients, other than infants, treated early chemotherapy is sufficient to suppress the etiologic agent or to render it relatively innocuous, patients who are most severely stricken may require assistance; to them antibodies must be supplied to augment the immunity response. Moreover, when pneumococci resist chemotherapy they may respond to type specific serum therapy, and therefore specific typing and immunity study of the blood and sputum are necessary for the best care of patients. When nonspecific (for type) chemotherapy is employed, patients in whom specific antibodies develop do not require serum therapy or additional chemotherapy. In such patients, tapering off the drug is unnecessary and may be harmful. The study of C protein (the acute phase protein which may be extracted from the bodies of decapsulated and no longer type specific pneumococci) response may be of value in the diagnosis and in the treatment when it is interpreted correctly. The presence of this protein in large amount indicates that a febrile episode is due not to continued infection or complication but possibly to the chemotherapeutic agent.

Acute Carbon Tetrachloride Poisoning.—Allison cites 2 cases of acute carbon tetrachloride poisoning, 1 in a 9 year old boy from inhalation and 1 in a man of 48, an alcoholic addict, who died ten days after drinking cleaning fluid. During the ten days symptoms and signs of extensive damage to the liver, kidneys and gastrointestinal tract were present. A necropsy confirmed the clinical manifestations. The boy had smeared red chalk on the covers of his bed, and in the process of cleaning it up with a tin of cleaning fluid he discovered that he liked the odor of the fluid and the way it made him feel. He poured a considerable amount on the blanket, replaced the tin and crawled into bed. He said that he saw stars and then couldn't remember anything. A few minutes later the boy was found under the covers, completely unconscious and breathing noisily. He was completely anesthetized for more than two hours. It is possible that there was some absorption through the skin. Definite evidence of hepatic damage occurred the next day: enlargement, tenderness and pain in the liver, a trace of bile in the urine, a high fever and leukocytosis. The importance of early intravenous administration of calcium and dextrose was not appreciated, and as the blood calcium was high calcium was given only by mouth. There was little evidence of renal damage. Hepatic tenderness persisted for two weeks and enlargement for a month. These physical signs and an evening fever, an increase in the polymorphonuclear leukocyte count and a slight elevation of the blood sedimentation rate indicated that repair was not complete in three weeks. During the next six weeks an elevation of temperature to between 100 and 101 F. on slight exertion indicated continued disturbance, as no other cause could be found for this fever. The author suggests the following outline for the treatment: removal of all unabsorbed carbon tetrachloride from the gastrointestinal tract, forcing of fluids by mouth and intravenously, prevention or treatment of signs of intoxication and organic damage, transfusion of blood or blood plasma if much blood has been lost, repetition of the chemical study of the blood until it returns to normal and complete rest in bed until evidence of hepatic and renal damage has disappeared. Carbon tetrachloride poisoning presents a definite health hazard. The proper labeling of products containing it should be required by law, and writers of textbooks should consider carbon tetrachloride poisoning a disease entity and thus make its nature and treatment known.

Archives of Ophthalmology, Chicago

27:231-442 (Feb.) 1942

Ring Ulcer of Cornea. S. R. Gifford, Chicago.—p. 231.
Water Movement and Eye. V. E. Kinsey, M. Grant and D. G. Cogan, Boston.—p. 242.
Carbaminoylcholine Chloride in Treatment of Glaucoma Simplex. C. S. O'Brien and K. C. Swan, Iowa City.—p. 253.
Pigmentary Degeneration of Retina: Role of Melanophore Hormone of Pituitary Gland in Pigmentary Degeneration of Retina. P. R. McDonald and F. H. Adler, Philadelphia.—p. 264.
Superficial Punctate Parenchymatous Keratitis. W. T. Davis, Washington, D. C.—p. 279.
Actinomyces: Recovery of Streptothrix in Case of Superficial Punctate Keratitis. G. M. Bruce and Devorah Locatcher-Khorazo, New York.—p. 294.
Purkynĕ: Pioneer in Ophthalmology. W. Thau, Boston.—p. 299.
Chemical Equilibrium Between Blood and Aqueous Humor: Further Studies. Eleanor Moore, H. G. Scheie and F. H. Adler, Philadelphia.—p. 317.
*Ocular Disturbances in Case of Acromegaly Complicated by Diabetes. J. Igersheimer, Boston.—p. 330.
Severe Uveitis with Associated Alopecia, Poliosis, Vitiligo and Deafness. W. Zentmayer, Philadelphia.—p. 342.
Lesions in Lens Caused by Purulent Corneal Ulcers. B. Samuels, New York.—p. 345.
Characteristics of Average Normal Nerve Head, with Reference to Classification of Optic Nerve Atrophy. B. Friedman, New York.—p. 353.
Aniseikonia: Refinement of Refraction. H. L. Birge, Hartford, Conn.—p. 357.
Hysterical Convergence Spasm. B. F. Souders, Philadelphia.—p. 361.
Paralysis of Superior Rectus and Inferior Oblique Muscle of Same Eye. J. W. White, New York.—p. 366.
Eyesight in Industry. L. L. Mayer, Los Angeles.—p. 375.

Acromegaly and Diabetes.—Igersheimer reports what appears to be the first case of acromegaly complicated by diabetes with retinal lipemia and peculiar visual disturbances consisting in reduction of vision to perception of movements of the hand and exophthalmos. Analysis of the ocular changes suggests that two processes were going on in the pituitary-diencephalic region: one was characterized by bitemporal hemianopia and was caused by the pressure of a pituitary tumor, and the other, superimposed on the first, involved central vision and the visual field as a whole and was located probably in the diencephalic region. The disturbances were favorably influenced by insulin and also by roentgen treatment.

Bulletin New York Academy of Medicine, New York

18:81-162 (Feb.) 1942

Influence of Extrinsic Factors on Coronary Flow and Clinical Course of Heart Disease. N. C. Gilbert, Chicago.—p. 83.
Pulmonary Congestion and Edema. S. Weiss, Boston.—p. 93.
Oxygen Supply Systems for Military Flying. J. R. Poppen, Washington, D. C.—p. 102.
Some Recent Advances in Drug Therapy. L. S. Goodman, New Haven, Conn.—p. 112.
Note on War Psychiatry. B. Glueck, Ossining, N. Y.—p. 137.
Friedrich August Kekulé: Architect of Atoms. H. Goodman, New York.—p. 150.

Endocrinology, Springfield, Ill.

30:1-174 (Jan.) 1942. **Partial Index**

Does Stimulation of Germinative Epithelium of Immature Male Rats Occur After Treatment with Gonadotropic Hormones, Augmentative Substance, Androgens and Vitamin E? B. Zondek, A. Brzezinski and F. Sulman, Jerusalem, Palestine.—p. 25.
Mammary Gland Development with Mammogen I in Castrate and Hypophysectomized Rat. A. A. Lewis, Columbia, Mo.; E. T. Gomez, Beltsville, Md., and C. W. Turner, Columbia, Mo.—p. 37.
Role of Progesterone and Local Trauma in Production of Cystic Glandular Changes in Endometrium and Hypertrophy of Myometrium. H. Selye, A. Borduas and G. Masson, Montreal, Canada.—p. 71.
Difference in Response of Mice of Different Strains to Human Pregnancy Urine. Katharine P. Hummel, Bar Harbor, Maine.—p. 74.
Pubertal Increase in Responsiveness to Androgen in Male Rat. C. W. Hooker, New Haven, Conn.—p. 77.
Effects of Estrogen on Androgenic Stimulation of Prostate and Seminal Vesicle of Rat. R. R. Greene and D. M. Thomson, Chicago.—p. 85.
Studies on Recovery of Reproductive System of Male Rat from Regressive Changes Induced by Stilbestrol. C. S. Mathews, E. L. Schwabe and F. E. Emery, Buffalo.—p. 89.
Effects of Testosterone Propionate in Immature and Adult Female Rats. G. L. Laqueur and C. F. Fluhmann, San Francisco.—p. 93.
Acid Phosphatase Activity of Human Urine, Index of Prostatic Secretion. W. W. Scott and C. Huggins, Chicago.—p. 107.
Blood Sugar Levels and Carbohydrate Combustion in Normal Men. J. W. Conn, Elizabeth Stern Conn and Margaret W. Johnston, Ann Arbor, Mich.—p. 113.
Primary Action of Parathyroid Hormone. A. H. Neufeld and J. B. Collip, Montreal, Canada.—p. 135.

Journal of Immunology, Baltimore

43:1-128 (Jan.) 1942

Development of Agglutinogens M and N in Newborn Infants, with Notes on Agglutinogens A and B. Harriet S. Hyman-Parker, Columbus, Ohio.—p. 1.
Rapid Pertussis Agglutination Test. H. M. Powell and W. A. Jamieson, Indianapolis.—p. 13.
Pneumococcus Types and Lobar Pneumonia in Netherland Indies. A. S. van Heukelom and H. Beeuwkes, Batavia, Java, Netherland East Indies.—p. 17.
Toxicity Indexes of Some Basic Antiseptic Substances. H. Welch and C. M. Brewer, Washington, D. C.—p. 25.
Antigenic Structure of Hemolytic Streptococci of Lancefield Group A: VII. Separation of Protein and Nucleic Acid of Type Specific M Substance and Some Chemical and Serologic Properties of Purified Type Specific Protein. C. A. Zittle, Philadelphia.—p. 31.
Id.: VIII. Electrophoretic Studies of Type Specific M Protein and Other Isolated Fractions. C. A. Zittle and Florence B. Seibert, Philadelphia.—p. 47.
Id.: IX. Some Physical Properties of M Protein. A. M. Pappenheimer Jr., J. W. Williams; and C. A. Zittle, Philadelphia.—p. 61.
Influence of Artificial Fever on Mechanisms of Resistance. H. V. Ellingson and P. F. Clark, Madison, Wis.—p. 65.
Relationship of Antigenicity, Physical-Chemical Properties and Polysaccharide Content of Tuberculins to Their Intracutaneous Activity. Janet R. McCarter and D. W. Watson, Madison, Wis.—p. 85.
Interaction of Pneumococcus II and Bacillus Friedländer B Antigen with Horse and Rabbit Antibodies. E. Perlman and J. G. M. Bullowa, New York.—p. 99.
Effect of Estrone on Antibody Production. E. von Haam and Irene Rosenfeld, Columbus, Ohio.—p. 109.
Reactions of Dextrans of Leuconostoc Mesenteroides with Antiserums of Leuconostoc and of Types II, XX and XII Pneumococcus. J. Y. Sugg and E. J. Hehre, New York.—p. 119.

Virginia Medical Monthly, Richmond

69:57-116 (Feb.) 1942

Office Gynecology: Diagnostic and Therapeutic Procedures Used by the Specialist Which Are Also Available to the General Practitioner. J. R. Miller, Hartford, Conn.—p. 59.
Gynecologic History and Examination. R. H. Hoge, Richmond.—p. 63.
Observations in Management of 230 Foreign Bodies in Air and Food Passages. E. G. Gill and J. H. Gressette, Roanoke.—p. 66.
Diseases of Liver: Clinical Features, Liver Function Tests and Treatment. F. B. Marsh, Salisbury, N. C.—p. 70.
Physician, Prescribe. K. L. Kaufman, Richmond.—p. 77.
Felty's Syndrome. L. Waitzkin, Norfolk.—p. 80.
Implanted Epidermoid Carcinoma in Pelvic Peritoneum: Report of Case. C. Williams and N. Bloom, Richmond.—p. 84.
Mortality Following Transurethral Resection. H. H. Curd, Charlottesville.—p. 87.
Undulant Fever, with Special Reference to Use of Brucella Vaccine in Diagnosis and Treatment: Report of Case. G. B. Arnold, T. S. Hershey and V. E. Lascara, Colony.—p. 90.
*Metrazol in Barbiturate Poisoning: Case Report. R. H. Walker and F. B. Teague, Martinsville.—p. 92.
Studies of Irradiation Effects on Cancer Cells: I. Preliminary Report; Production of Liver Cancer in White Rats. G. Z. Williams, M. K. Cary and J. T. Williams, Richmond.—p. 93.
Evaluation of Operation of Premarital Legislation in Virginia. I. C. Riggin and E. M. Holmes Jr., Richmond.—p. 96.

Metrazol in Barbiturate Poisoning.—Walker and Teague believe that, since pharmacologic studies seem to support the view that the depression resulting from overdosage with barbiturates involves chiefly the hypothalamus and the basal ganglions, metrazol and picrotoxin would theoretically be the analeptics of choice. However, metrazol seems to possess certain advantages. Chemically, it is pentamethylene tetrazol. It is a stimulant almost as powerful as picrotoxin, but its action is not as prolonged. There is no latent period, and its maximal effect is exerted almost immediately after it is injected, which practically eliminates the danger of convulsions from overdosage, as with the use of picrotoxin because of its delayed "peak" action. The authors recently had occasion to witness the antagonism of metrazol to barbiturate. The patient's recovery, following an intake of 2.5 Gm. of sodium 5-ethyl 5-(1-methyl 1-butenyl) barbiturate (delvinal sodium) was rapid after other methods proved ineffective; convalescence was uneventful.

Wisconsin Medical Journal, Madison

41:101-184 (Feb.) 1942

Drugs in Intractable Pain. M. H. Seevers, Madison.—p. 113.
Management of Endocervicitis. T. K. Brown, St. Louis.—p. 117.
Syphilis in Wisconsin. W. F. Lorenz, Madison.—p. 121.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Radiology, London

15:33-64 (Feb.) 1942

Duodenitis. G. R. M. Cordiner.—p. 33.
Effect of Ionizing Radiations on Broad Bean Root. L. H. Gray and J. Read.—p. 39.
*Contact X-Ray Treatment of Cavernous Angioma in Children. Inez ApThomas.—p. 43.
Note on Skin Dose Measurement of Radium Molds: Gamma Ray Back Scatter. H. F. Cook.—p. 48.
Spatial Distribution of X-Rays and Total Energy Absorption: Consideration of Importance of These Concepts in X-Ray Treatment of Cancer. D. W. Smithers.—p. 50.

Treatment of Cavernous Angioma in Children.—From 1933 to September 1939 ApThomas states that 120 children with cavernous angiomas have been treated with elastoplast molds of radon seeds, 24 with gold seeds and 11 with other radium mediums. Of the 120 children 110 are well and 10 are improved, of the 24 all are well and of the 11 7 are well and 4 are improved. Since September 1939 the three foregoing methods have become impracticable and from then until Dec. 31, 1940 102 children with cavernous angiomas have received contact roentgen therapy for which the Chaoul tube was used at 60 kilovolts and 4 milliamperes. Sixty-seven of the 102 children are well, 6 are improved and the treatment in 29 was incomplete.

British Medical Journal, London

1:31-60 (Jan. 10) 1942

Evolution as Etiologic Factor in Foot Disorders. N. C. Lake.—p. 31.
17-Ketosteroid Excretion in Adrenal Virilism. Jocelyn Patterson, Isobel M. McPhee and A. W. Greenwood.—p. 35.
Fluoroscopic Control in Reduction of Fractures. F. H. Kemp.—p. 39.
Simple Method of Reducing Mid Shaft Fractures of Humerus. G. D. Rowley.—p. 41.
*Sneezing and Disinfection by Hypochlorites. R. B. Bourdillon, O. M. Lidwell and J. E. Lovelock.—p. 42.

Sneezing and Disinfection by Hypochlorites.—Bourdillon and his associates present the data of a brief quantitative study of the number of bacteria carrying particles given out during sneezing, of the rate at which the bacteria disappear from the air in a closed room and of the rate at which they are killed by sodium hypochlorite sprayed into the air with a hand spray. Fifteen tests in a closed room revealed that an average vigorous sneeze causes the emission of about 100,000 bacteria carrying particles of a size small enough to remain in the air for more than one minute. Of these about 4 per cent will usually remain suspended in still air for as long as thirty minutes. All or almost all the bacteria thus emitted can be killed in three to four minutes by a spray of a 1 per cent solution of sodium hypochlorite in a concentration of 2.1 cc. per thousand cubic feet of air. Under certain unfavorable conditions, such as low relative humidity or a high content of organic matter in the air, the action of the hypochlorite spray may be hindered.

1:61-98 (Jan. 17) 1942

Infective Hepatitis: History of Outbreak in Lavant Valley. J. L. Newman.—p. 61.
*Value of Procaine Infiltration in Diagnosis and Treatment of Fibrositis. E. J. Moynahan and E. S. Nicholson.—p. 65.
Ruptured Aneurysm of Splenic Artery During Pregnancy. J. F. E. Gillam.—p. 69.
Arm to Tongue Circulation Time in Chronic Asthma. J. D. Cottrell and D. C. Cuddie.—p. 70.

Procaine Infiltration for Fibrositis.—Moynahan and Nicholson subjected more than 80 patients with fibrositis to infiltration of the painful areas with procaine hydrochloride. Only 6 patients failed to obtain relief or cure, in all but 1 of whom the diagnosis was erroneous, 3 had osteoarthritis of the spine, 1 sacralization of the fifth lumbar vertebra and 1 a severe dislocation of the acromioclavicular joint, with fracture of the acromial end of the clavicle, which was mistaken for a deltoid fibrositis. The sixth patient had fibrositis of the shoulder girdle and left arm with no definite tender spots, and "blind" infiltration failed to relieve the condition. After the tender spots are determined by digital palpation they should be marked on the skin, and after the skin is cleansed a wheal should be raised by injecting a small quantity of procaine hydrochloride over the site of the lesion. The needle should be driven down until the tender spot is reached and then 2 to 3 cc. of the solution should be injected. The injection gives immediate relief from pain, and any associated tenderness or muscular spasm disappears. A dental syringe and needle are probably best suited for the infiltration. Some patients experience a return of pain a few hours after the injection, but this pain usually wears off in a few hours. The patient should be encouraged to move the affected part freely and to carry on with his normal occupation. Usually one injection suffices. Every tender area should be infiltrated and the pain eliminated completely at the first sitting.

Edinburgh Medical Journal

49:1-72 (Jan.) 1942

Footprints of Surgery: Inaugural Address to Royal Medical Society on Oct. 17, 1941. W. I. de C. Wheeler.—p. 1.
Experiences in Emergency Medical Service Base Hospital in London Area. R. L. Galloway.—p. 16.
Abdominal Lymphadenoma, with Transposition of Viscera and Nine Accessory Spleens: Case. A. J. Rhodes and A. Grunberg.—p. 29.
Osteochondritis and Tuberculosis: Demonstration of Cases of Calve's Disease of Spine and Kohler's Disease of Tarsal Scaphoid, with Discussion on Their Relationship to Tuberculosis. A. Dale.—p. 34.
Studies on Stored Blood: IX. Further Observations on Effects of Storage on Erythrocytes. A. Crosbie and H. Scarborough.—p. 40.

Lancet, London

1:31-62 (Jan. 10) 1942

Neurosis Simulating Organic Disorder. G. T. Cook and W. Sargant.—p. 31.
Assessment of Foot Function: Anatomic and Clinical Considerations. H. A. Harris.—p. 32.
Natural History of Bright's Disease: Clinical, Histologic and Experimental Observations. A. Ellis.—p. 34.
Mode of Action of Sulfonamides in Vitro. S. D. Rubbo and J. M. Gillespie.—p. 36.
The Dyspeptic Soldier: Record of 931 Consecutive Cases. W. Brockbank.—p. 39.
Disturbances of Body Scheme: Anosognosia and Finger Agnosia. J. D. Spillane.—p. 42.
Agnosia of Hemiplegia and of Blindness After Cerebral Embolism. F. P. Weber.—p. 44.

1:63-94 (Jan. 17) 1942

Medical Graduation at Cambridge: Statistical Note. M. Greenwood and A. Teleky.—p. 63.
*Neonatal Thrush in Maternity Hospital. G. B. Ludlam and J. L. Henderson.—p. 64.
Amnioplastin for Adherent Digital Flexor Tendons. M. C. Pinkerton.—p. 70.
Natural History of Bright's Disease: Clinical, Histologic and Experimental Observations. A. Ellis.—p. 72.

Neonatal Thrush in Maternity Hospital.—Ludlam and Henderson point out that the high incidence of thrush found on routine clinical examination of the infants in a maternity hospital was increased when accompanied by bacteriologic examination. The incidence was much higher among bottle fed infants and among those who were in the hospital a long time. These factors account for the extremely high incidence of thrush in premature infants. There was no evidence that local trauma, debility or prematurity predisposed to thrush. The causal organism, Monilia albicans, can be isolated several days before lesions become visible, and it usually persists after the lesions disappear. Therefore isolation must continue until discharge, unless a negative swab has been obtained. M. albicans can be isolated from the feces of most infected infants and also from the hands of 50 per cent of them. There was no significant relationship between the vaginal infection of a mother and the infection in her infant. M. albicans was isolated from the throat in a third of the nurses and was found on the fingers of a few. The organism was found in samples of pooled breast milk used for bottle fed infants. The incidence of thrush fell somewhat after such milk was heated. The principal causes of the high incidence were overcrowding in the nurseries, failure to prevent spread from infant to infant and failure to make an early diagnosis with its consequent isolation and treatment.

Tubercle, London

22:257-280 (Nov.) 1941

Tubercle Bacillus in Sputum, with Special Reference to Branching Forms. R. A. Hunter.—p. 257.
Infective Dose in Pulmonary Tuberculosis. A. L. Jacobs.—p. 266.

Monatsschrift für Geburtshilfe und Gynäkologie, Basel

112:313-372 (No. 6) 1941. **Partial Index**

Significance of Threatened Abortion for Later Course of Labor. R. Wenner.—p. 325.
*Cause of Torsion of Pedicle of Ovarian Tumors. H. von Wattenwyl. —p. 335.
Principal Problem in Campaign Against Cervical Carcinoma. H. Buess. —p. 348.
Role of Man in Sterile Marriages. C. A. Joel.—p. 360.

Cause of Torsion of Pedicle in Ovarian Tumors.—Von Wattenwyl reviews the classic theories of the cause of torsion of ovarian tumors. Analysis of 59 cases of ovarian tumors with twisted pedicle and comparison with ovarian tumors without torsion demonstrate that none of the theories heretofore advanced alone explain all cases and that the patient's age and number of deliveries and the form, size and histologic characteristics of the growth cannot be of essential importance in the twisting of the stalk. On the phantom and in animal experiments torsion of the pedicle can be artificially produced if certain positions are produced, but no new theory can be deduced from this nor can it serve as proof of the validity of one of the former explanations. Sellheim's theory is rejected on the basis of clinical analyses and experiments. The influence of changing vesical and rectal filling on the position of the tumor and in the pathogenesis of torsion of the pedicle was demonstrated in a phantom experiment. However, influence of peristalsis could not be demonstrated in animal experiments, and the role of hemodynamic factors remains undecided. Torsion of the pedicle apparently takes place only when several favoring factors develop at the same time. This explains its relative rarity.

Día Médico, Buenos Aires

14:33-52 (Jan. 19) 1942. **Partial Index**

*Clinical Symptoms and Roentgen Signs of Malignant Tumors of Bones. O. Copello.—p. 33.

Clinical Symptoms and Roentgen Signs of Malignant Tumors of Bone.—Copello made observations on 60 patients with malignant tumors. Local pain, tumor and dysfunction of the involved limb are common to all malignant tumors of bone. Malignant osteoblastoma and osteogenic sarcoma develop from bone cells of osteogenic tissues of bone in patients between the ages of 15 and 25. Tumors of these types are rare after 50. Persistent local pain may be the only symptom for a long time. The tumor is solitary. A local venous network is formed, and the temperature of the local skin is increased. Edema is observed in cases of advanced tumor. The tumor develops preferably in the metaphysis of the long bones, especially the femur and the tibia. The patients live in a relatively good condition for a long time. Fever, leukocytosis and pathologic fractures are rare. Metastasis to the lung and to other bones develops early in the course of the disease. The tumor appears in the roentgenogram as a round or fusiform shadow. Bone changes are typical of osteolysis, of osteogenic reaction of the tumor and of the cortex and destruction of bone. Reticulosarcoma of Ewing's type develops from bone cells of reticuloendothelial tissue of bone in patients between 10 and 30 years old. The solitary tumor appears early in the course of the disease, develops rapidly and forms metastases in bones. Pathologic fractures occur in 40 per cent of cases. Fever and leukocytosis are frequent. The general condition of the patient deteriorates, and the weight rapidly diminishes. The two main types of roentgen changes are osteolytic and the reactional osteogenic. Myeloma develops from bone cells of the hemopoietic tissue of the bone. The tumor is either multiple or generalized. It develops in persons between the ages of 30 and 48. The thoracic bones are the ones most frequently involved. Osteogenesis is not produced. Pathologic fractures occur in 62 per cent of the cases. Destruction of bone is the cause of various thoracic deformities with consequent bronchopulmonary disease. Renal complications occur. Roentgenograms show multiple or generalized osteolysis and destruction of the cortex of bone similar to the changes due to general metastases of other tumors. Medullary fibrosarcoma develops from bone cells of the connective and vascular tissues of bone in patients between the ages of 30 and 50 years. Any bone may be involved. The femur is the seat of predilection. The disease is more frequent in women than in men. The tumor is large and painful to pressure. Pathologic fractures are frequent. The tumor gives rise to early metastasis by way of the blood.

Revista Española de Tuberculosis, Madrid

10:499-548 (Sept.) 1941

*Limited Costal Resections in Adherent Pulmonary Zones in Case of Ineffective Artificial Pneumothorax. P. A. Buylla and D. Garcia Alonso.—p. 499.
Reflections on Antituberculosis Campaign. C. Xalabarder.—p. 505.
Antituberculosis Vaccination and New Ideas Regarding Epidemiology of Tuberculosis. A. Urgoiti.—p. 515.
Problem of Work of Tuberculous Patients. J. A. Renedo.—p. 521.
Systematic Investigations as Chief Function of Antituberculosis Dispensaries. R. Navarro Gutiérrez and F. Paz Espeso.—p. 523.
Era of Tuberculin. Verdes Montenegro.—p. 527.
*Campaign Against Tuberculosis and Children's Homes. R. Navarro Gutiérrez and R. Martinez Alvarez.—p. 531.

Limited Costal Resection in Ineffective Pneumothorax.—Buylla and García Alonso present the history of a woman aged 24 with severe ulcerative tuberculosis of the upper lobe of the right lung. Artificial pneumothorax proved ineffective because of extensive inoperable posterior adhesions which kept a large cavity open. Extrapleural pneumonolysis was considered dangerous because of the type and localization of the cavity. Phrenic exeresis would probably not have had a beneficial effect because of the high parietal localization of the cavity. Abandonment of the artificial pneumothorax was regarded as a poor solution. Limited costal resection in the zone of adhesions seemed to be the only treatment from which closure of the cavity might be expected. The operation was relatively well tolerated and was followed by rapid improvement of the clinical symptoms with immediate reduction in the volume of the cavity. In spite of the early appearance of an exudate which necessitated premature abandonment of the therapeutic pneumothorax the patient was clinically and roentgenologically cured twenty-two months after the operation. Examination for bacilli gave negative results. Limited costal resection in the zone of pulmonary adhesions, employed with the aim of completing an ineffective pneumothorax, deserves consideration when other complementary or substitutional treatments are impossible.

Campaign Against Tuberculosis.—Navarro Gutiérrez and Martínez Alvarez stress that an open tuberculous lesion is the chief focus of infection and that the isolation of the patient is therefore of primary importance. They discuss the danger of conjugal infection and the possibility that parents may become infected by tuberculous children, but they regard the danger for children, particularly young children, as being much greater if the parents have open tuberculosis, in which case it will often be more economical and more effective to remove the children than the patient. It is suggested that children in poor homes where the mother has open tuberculosis and eliminates tubercle bacilli should be placed in the children's homes of the Auxilio Social (social aid).

Geneeskundig Tijdschr. v. Nederl.-Indië, Batavia

81:2573-2620 (Dec. 2) 1941

Autoregulation of Blood Pressure. A. de Waart.—p. 2574.
Detachment of Torpid Cutis of Possible Tuberculous Etiology: Case. R. Kornel Singawinata.—p. 2595.
*Chondroma of Scapula. L. P. van Lelyveld.—p. 2601.

Chondroma of Scapula.—According to van Lelyveld, chondroma is comparatively rare and the localization in the reported case is an exception. A Javanese aged 25 came to the hospital with a painful swelling which had existed in the middle of the left scapula for about two years. Roentgenoscopy disclosed bony tissue, and an exploratory excision revealed an osteochondroma. The growth was connected to the surrounding muscles, which had to be removed in part. The postoperative course was normal and the patient was discharged without complaints. The surgical specimen measured 11 by 8 by 6 cm. Sectioning disclosed chiefly cartilage with here and there inclusions of bone tissue, of which it could not be ascertained whether they were originally bone or ossified chondroma.

Book Notices

The 1941 Year Book of Industrial and Orthopedic Surgery. Edited by Charles F. Painter, M.D., Orthopedic Surgeon to the Massachusetts Women's Hospital, and Beth Israel Hospital, Boston. Cloth. Price, $3. Pp. 432, with 353 illustrations. Chicago: Year Book Publishers, Incorporated, 1941.

It is not often that a doctor gets so much for so little. This applies especially to general practitioners and to industrial, traumatic and military surgeons. The best of the leading articles of the year have been selected by the editor and have been abstracted. Some of the two hundred and twenty-two contributions include locking wrist, arthritis, emergency fracture treatment, industrial medicine, differential diagnosis of low back pain, treatment of war wounds of limbs and war burns, treatment of painful feet, four essential points in immediate care of industrial injuries, five principles of management of hand infections, gout, fractures of the forearm and elbow in children, scalenus anticus syndrome, first aid for injuries to the knee and spinal column, special splints for the fingers and thumb, treatment of acute osteomyelitis in children, technic of pedicled flaps for skin plastics, early diagnosis of tuberculosis of the knee in young adults, conservative surgery and roentgen therapy of benign and malignant bone tumors.

Woman's Personal Hygiene: Modern Methods and Appliances. By Leona W. Chalmers. Foreword by Winfield Scott Pugh, B.S., M.D. Drawings by Alfred Feinberg. X-rays by Winfield Scott Pugh, M.D. Photographs by Tom Rodd. Cloth. Price, $2. Pp. 192, with 32 illustrations. New York: Pioneer Publications, Inc., 1941.

This book was prepared by a lay woman, the wife of a physician, as an educational contribution for the enlightenment of all women, especially from the point of view of sex health. The subjects discussed are the anatomy of the female pelvic organs, the glands of internal secretion, displacements of the uterus, dysmenorrhea, leukorrhea, venereal disease, vaginal hygiene, vaginal douches, postpartum exercises and marital relations. At the end of the book is a list of "don'ts," with some of which the reviewer disagrees. The author says "Don't fail to take an occasional douche, regardless of your excellent health. Douches are refreshing and most women need a 'vaginal cocktail' at least twice a week." This surely is not sound advice. Furthermore, the author says "Don't put off visiting your doctor if you have any pelvic displacements." How is the patient to know about her displacement and, even if she has one, does this always or even usually call for treatment? Also "Don't fail to keep the genitals immaculate at all times." This is a peculiar use of the word "immaculate." On the whole the advice given is excellent. The author quotes a number of leading American authorities throughout the book and gives a bibliography. The language is clear and there are many illustrations which greatly enhance the text.

Allergy in Clinical Practice. By Staff-Members of the Cleveland Clinic. Under the direction of Russell L. Haden, M.D., F.A.C.P., Chief of the Medical Division. Edited by J. Warrick Thomas, M.D., F.A.C.P., Chief of the Section on Allergy. Fabrikoid. Price, $5. Pp. 354, with 92 illustrations. Philadelphia, Montreal & London: J. B. Lippincott Company, 1941.

A passage from the introduction well describes the purpose and the scope of this volume: This book has been prepared primarily to illustrate the role of allergy in the production of disease in man. A specialist in each field in which allergy is applicable has evaluated this principle in his field, which seems to be much more desirable than the allergist to evaluate the role of allergy in some other specialist's field.

After the introduction and general discussion on the allergic approach the book devotes a chapter each to bronchial asthma, hay fever, perennial nasal allergy, allergic bronchitis, bronchiectasis, contact dermatitis, atopic dermatitis, drug eruptions, fungus allergies, urticaria, gastrointestinal allergy, ocular manifestations, allergic headaches, endocrine considerations and miscellaneous manifestations. The problems of diagnosis receive proper consideration, and the importance of an adequate and complete history in all cases of allergic disease is emphasized, as rightly should be done. The necessity for careful differential diagnosis before an allergic investigation is undertaken and the search for coexisting disease of a nonallergic origin requires, according to the authors, cooperation between the allergist and various specialists.

Treatment for each condition is outlined in a general manner, and then a number of detailed case histories are used to illustrate each disease that has been discussed. These case histories represent nearly 50 per cent of the subject matter of the book. The cooperation in treatment, as in diagnosis, of specialists in different fields is set forth as the ideal means of serving the best interests of the allergic patient.

The details of allergic examination, such as preparation of antigens, skin testing and numerous other details of procedure, are omitted, as they should be in a book of this nature. Hyposensitization is dealt with briefly in the chapter on hay fever.

Preference is expressed for the perennial type of treatment of this condition. It is gratifying that the authors do not deal with procedures of questionable merit or unproved therapeutic value, many of which have received more or less prominence in recent years. There are, however, some statements that should not go unchallenged, of which the following one, in reference to allergic conjunctivitis, is an example: "Among the inhalant factors, dust, feathers, molds, tobacco smoke and ashes, pollens and animal epidermals must be considered as etiologic suspects." There is no evidence in the literature that tobacco smoke or ashes can be more than mechanical irritants, and certainly they cannot be primary etiologic agents.

This book is written by clinicians; it is not a highly scientific work, nor does it bring out any particularly new ideas. It does serve to bring to the attention of readers who have not followed the rapid strides which allergy is making that allergy may be a factor in diseases other than hay fever and asthma. It should make its readers in general alert to consider an allergic basis in the differential diagnosis of many obscure conditions. There are numerous helpful illustrations throughout the text.

Diseases of Women. By Harry Sturgeon Crossen, M.D., F.A.C.S., Gynecologist to the Barnes Hospital, St. Louis, and Robert James Crossen, A.B., M.D., Assistant Professor of Clinical Gynecology and Obstetrics, Washington University School of Medicine, St. Louis. Ninth edition. Cloth. $12.50. Pp. 948, with 1,127 illustrations. St. Louis: C. V. Mosby Company, 1941.

This textbook of gynecology is remarkable for its excellent illustrations. Apparently the senior author has been collecting sketches and figures ever since his first edition thirty-four years ago. As a result, the present edition depicts the technic of vaginal examination with a series of plates which is perhaps unequaled. These are accompanied by a detailed description of the manipulations essential to accurate diagnosis. If pelvic diagnosis can be taught by a book, this is the book to do it. In other respects also the work is excellent. Many handsome colored plates have been borrowed from the literature of pharmaceutic houses, and many nearly perfect photographs in color have been secured from other sources. The section on endocrinology has been brought up to date, even though momentarily. References are easily found in a section of twenty-four pages at the end of the book. The main volume of material is what may be expected in a standard textbook of gynecology. No additional commendation is necessary. As a medical book passes through many editions, it often suffers more from what is retained than from what is added. This fine work is no exception; much could be compressed, much omitted. It is not easy for the surgeon to place his book under the scalpel.

A Text-Book of Neuro-Anatomy. By Albert Kuntz, Ph.D., M.D., Professor of Micro-Anatomy in St. Louis University School of Medicine, St. Louis. Third Edition. Cloth. Price, $6. Pp. 518, with 307 illustrations. Philadelphia: Lea & Febiger, 1942.

This excellent work contains the same number of illustrations as before but some of them are new. All the practical features of the second edition are retained. The newer studies of the diencephalon are included. Microscopic studies of the cerebral cortex have been added. Twenty-six chapters comprise the contents, beginning with the evolution and comparative anatomy of the nervous system and concluding with a laboratory outline. The author expresses himself with clarity and interest. The book is written concisely and should be in the library of every medical man interested in neurology.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

COMBINED DIPHTHERIA AND WHOOPING COUGH IMMUNIZATION

To the Editor:—**Please advise me regarding the efficacy of combined diphtheria and whooping cough serum. Is use of this form preferable to the old method of giving separate immunization?**

Alfred H. Hathcock, M.D., Fayetteville, Ark.

ANSWER.—Although a few preliminary reports on the injection of a mixture of pertussis vaccine and diphtheria toxoid for the simultaneous prevention of whooping cough and diphtheria have recently appeared, sufficient time has not elapsed for clinical evidence to prove that protection against whooping cough has thus been conferred.

It seems premature to recommend to physicians in private practice the use of any of the products so far proposed. Carefully controlled clinical studies, covering a period of years, should ultimately decide whether such simultaneous immunization will confer prolonged immunity. The reactions to mixed or so-called combined antigens, especially those made with alum, is more severe than that which ensues when the antigens are injected singly.

SIGNIFICANCE OF THE DEXTROSE TOLERANCE TEST

To the Editor:—**For a patient with chronic weakness and lassitude what significance have the following results of the dextrose tolerance test, obtained after 100 Gm. of dextrose has been given by mouth?**

	Blood Sugar	Urine
Fasting	90	—
1 hour	63	—
2 hours	94	—
3 hours	80	—
4 hours	76	—
5 hours	75	—
6 hours	78	—

L. A. Crowell Jr., M.D., Lincolnton, N. C.

ANSWER.—In recent discussions (Lepore, M. J.: Clinical Significance of Low or "Flat" Oral Glucose Tolerance Curve, *Ann. Int. Med.* **14**:2008 [May] 1941. Lepore, M. J., and Golden, Ross: A Syndrome Due to Deficiency of the Vitamin B Complex, THE JOURNAL, Sept. 13, 1941, p. 918) the known causes of a low or "flat" oral dextrose tolerance curve have been classified as follows: (*a*) poor or slow absorption of dextrose from the digestive tract, (*b*) rapid removal of dextrose from the blood stream and (*c*) combinations of *a* and *b*. Among the diseases mentioned are sprue, malnutrition, vitamin B deficiency states, celiac disease, tuberculosis of the small intestine, tumors of the small intestine, hyperinsulinism, previous high carbohydrate diet, Addison's disease, hypopituitarism including Simmonds' disease, hypothyroidism and renal glycosuria. The reader is referred to the articles cited for a full discussion.

With the patient in question one wonders as to the validity of the figure of 63 mg. per hundred cubic centimeters at the one hour interval. It seems inconsistent with the other values obtained.

Inspection of the values rules out certain of the diseases mentioned. The relatively normal fasting value and the fact that the six hour value is no lower than 78 mg. are against hyperinsulinism due to an islet cell tumor. The absence of glycosuria except in one specimen rules out renal glycosuria. Not enough clinical and laboratory data are furnished to enable one to analyze the situation further, but with the possibilities outlined kept in mind the analysis may be possible. Prominently to be considered are vitamin B deficiency and the endocrinopathies listed.

It would be well worth while to repeat the test, at first giving the dextrose orally and then, on a second occasion a week later, intravenously. It must be emphasized that the results of a dextrose tolerance test are influenced by many variables and must always be interpreted with caution and with regard to clinical findings.

SAKE, JAPANESE RICE WINE

To the Editor:—**Please give me information as to sake (Japanese rice wine) from a clinical point of view. I refer more particularly to any harmful (or beneficial [?]) effects it may have of an unusual or specific sort as compared to other strong alcoholic beverages; for example, does it conduce to alcoholic polyneuritis more than other alcoholic drinks of more or less equal alcoholic content (it has 17 per cent plus)? In the medical library here and in the city's public library I have not as yet been able to find any information at all of a clinical nature and no references to it even in the indexes of volumes on toxicology, legal medicine and the like. All other books even mentioning sake are rather brief and incomplete as to any information.**

H. Otto Sommer, M.D., Denver.

ANSWER.—The following information has been taken from Edward R. Emmerson's "Beverages, Past and Present," *Chemical Abstracts* and other sources.

The Japanese beverage sake is unique in character, since it is not beer, wine or brandy, but it resembles all three and is often spoken or written of as rice beer, rice wine or rice brandy. Authentically, sake was introduced into Japan about the fourth century. The name seems to be derived from the city Osaka. It is yellowish white and has an acidulous, sherry flavor. It is high in alcoholic content, running 12 to 17 per cent by volume. Sake is the national beverage of Japan and has spread over our Western states through Japanese immigrants. The drink is served in porcelain cups and consumed at body temperature. It is made by Emil Sick of the Lethbridge Brewing Company, Lethbridge, Alberta, Canada.

The mode of preparation varies, but the principal steps are as follows: A culture of a ferment or enzyme (fungus, mold) called koji is prepared by growing on rice medium. Hulled rice is washed with fresh water until the water runs off clear. The last water remains on the rice and is steamed to gelatinize the rice and prevent it from sprouting. The soft material is spread on straw mats to cool. At blood temperature this medium is seeded with fane-koji, a sporadic growth of fungus ("fane" meaning seed) and thoroughly mixed. After several days, during which time the material assumes a less viscous state, the mash is prepared. This consists of 10 parts of rice, 4 parts of koji ferment and 12 parts of water, all taken by weight. The mixture is kept at favorable temperatures for fermentation, and in about fourteen days this is completed. The material is now ready to be filtered under pressure, and the turbid liquor is placed in a vertical cask for clarification. After several months the product is ready for consumption. Sake is made during the cold months of the year.

The literature has little on the subject of vitamins in sake. The occurrence of vitamin B_2 in sake and sake-kasu (pressed cake) was investigated by Inukai, Higashi and Nakahara (Scientific Papers, Institute of Physicochemical Research, Tokyo **24**:113, 1934). Animal experiments described in this paper demonstrate that sake-kasu and raw sake are good sources of the growth promoting vitamin B_2. The antineuritic vitamin B_1, does not seem to be contained in these fermentation products. A striking difference was found between the bottled sake on the market and the raw sake before the "hire" treatment (heating to stop further fermentation). The difference probably is due to the fact that sake producers treat sake with animal charcoal in order to decolorize the commercial product, with the resultant removal of the growth promoting vitamin.

Since the manufacture of sake is somewhat similar to that of beer, it may be assumed that the vitamins in the two products share a similar fate. In beer it is known that thiamine is destroyed to the extent of over 90 per cent during the process of fermentation, so that 100 cc. of beer contains but 1 international unit, or about one three-hundredth of the daily requirement of this vitamin. It may therefore be assumed that sake would have the same relationship to polyneuritis that vitamin free beverages of the same alcoholic strength would have.

GREEN SWEAT

To the Editor:—**A machinist aged 35 whose present work entails considerable drilling of iron castings at relatively high speeds perspires moderately with a material that stains his underclothing green. Information relative to this condition will be greatly appreciated. Would working in bronze produce any different reaction?**

M.D., Ohio.

ANSWER.—It would be of interest to know whether the perspiration itself of this workman, as well as the fabric of the underclothing, is actually greenish and whether the color occurs in the perspiration from all parts of the body. It would be of interest to know also the duration of the coloration, if it existed before the present job and if it occurs only during the working period or during week ends or vacations on vigorous exercise. Certain persons have a brownish, reddish or even a faint yel-

lowish color to the axillary portion of the underclothing caused by masses of chromogenic bacteria attached to the hairs in that region. Cases of true chromidrosis have been reported rarely. Green sweat supposedly from the ingestion or absorption of copper has been seen in a few cases, and in 1 case blue chromidrosis was presumed to be due to the iron the patient had been taking. The standard works on occupational dermatoses do not cite any cases of green coloration from perspiration in connection with iron or steel workers, but reference is made to a greenish discoloration of perspiration among workers exposed to bronze dust. If the inquirer's patient has a true green chromidrosis it would be of great interest from the physiologic point of view to attempt to work out the etiologic factors.

HEALTH HAZARDS IN PEARL BUTTON INDUSTRY

To the Editor:—A woman aged 35 has had a persistent cough and frequent head colds for ten months and has lost 27 pounds (12 Kg.) during the last twelve months. She works in a pearl button factory at feeding a machine which bores holes and grinds buttons and creates considerable dust. A roentgenogram of the chest showed no evidence of tuberculosis. The sinuses are clear except for acute coryza. There are no evidences of other diseases. I should like to know if the dust from the pearl buttons (made from mussel shells) could have any significance in this case. W. B. Wilcoxen, M.D., Bowling Green, Mo.

ANSWER.—In 1920 Birge and Havens published an article on health hazards in the pearl button industry (*J. Indust. Hyg.* **2**:81 [July] 1920). They reported that the general health of employees was good at that time but that "catarrhal conditions" were extremely common. The rooms where buttons were bored and ground were equipped with an exhaust system, but there was still a good deal of dust.

No roentgenograms were made, but physical examination revealed no more tuberculosis than was present in the population of the community. Contrary to the general impression, infections of the hand and osteomyelitis of the bones of the hand and forearm were not discovered. Rheumatism and indigestion were common complaints.

From the data available it is difficult to imagine the cause of the symptoms described in the query.

EFFECT OF MERCURY VAPOR LAMPS ON THE EYE

To the Editor:—I should like to know if there is any evidence that mercury vapor lamps, as used for industrial lighting, cause any symptoms of eye irritation or disturbances of vision. If there is no direct effect on the eyes, would the distortion of colors (of manufactured parts, such as various colored cables) be a source of eye irritation or visual disturbance?

H. W. Garton, M.D., Fort Wayne, Ind.

ANSWER.—Mercury vapor lamps, when the rays are directed into the eye, can cause an irritating conjunctivitis and superficial punctate keratitis. The lights used industrially, however, are usually very high and of insufficient intensity to cause irritation to the average person. A light-complexioned individual is more susceptible to such rays than a brunet type. It is unlikely that working on colored objects under colored light would be any additional source of irritation. Exposure without the use of goggles for a long time to the rays from colored vapor lamps, in the form of the so-called sunlight lamps, produces a superficial punctate keratitis of varying degrees, depending on the length of exposure, and can even cause permanent visual disturbance by opacities of the cornea.

Basil Graves cites such a case in "The Eye and Its Diseases" by Behrens; and Duke Elder, in his "Advances of Ophthalmology" (Philadelphia, P. Blakiston's Sons & Co., 1934), describes the pathology of this condition.

INTRAVENOUS MERCUROCHROME FOR UNDULANT FEVER

To the Editor:—Intravenous mercurochrome therapy is commonly used here for infections of the blood stream. I was criticized for not using it in a case of acute undulant fever. What is the present status of the intravenous mercurochrome treatment of acute undulant fever or of any infection of the blood stream? M.D., New York.

ANSWER—Evidence that intravenous administration of mercurochrome significantly modifies the course of brucella infections has never been presented, beyond an occasional, and sometimes striking, immediate clinical improvement. When improvement has occurred a causal relationship has not always been clear, and recorded postrecovery observation periods have been so short that claims of recovery or cure cannot be substantiated. The treatment is not entirely safe. Chills, hyperpyrexia, vomiting, abdominal pain, diarrhea and albuminuria are frequent side effects. Complete anuria has resulted.

For most of the commonly encountered septicemic infections chemotherapy with an appropriate sulfonamide derivative is safer and demonstrably far more efficacious than mercurochrome therapy.

RETINITIS PROLIFERANS

To the Editor:—I should like information on the latest methods of therapy for retinitis proliferans. R. H. Kuhns, M.D., Los Angeles.

ANSWER.—Retinitis proliferans is a complication of general disease, such as diabetes, inflammations or injuries, or is due to hemorrhage of the retina and vitreous. The treatment therefore depends to some extent on the cause.

In the diabetic form, of course, general treatment is indicated. In the inflammatory form, Dugan advises foreign protein therapy, nitrites intravenously and by mouth. Potassium iodide internally is the old standard treatment, and high doses of vitamin C with vitamin B complex may be used in this condition regardless of the cause. Subconjunctival injections of sodium chloride are used by some, and ethylmorphine hydrochloride applied locally in the conjunctival sac is advised by others. Such local applications are of doubtful value.

Prognosis is poor, and treatment is most often without avail.

HYDROTHORAX IN CONGESTIVE HEART FAILURE

To the Edtior:—Is there an explanation for the development of hydrothorax in congestive heart failure in the right side of the chest so much more frequently than in the left side? M.D., Utah.

ANSWER.—There is not as yet any proved explanation as to why hydrothorax in congestive heart failure is so much more frequent on the right side than on the left. A likely answer is based on the anatomic configuration of the venous return of blood from the pleural cavities. On the right side drainage is by way of the vena azygos major directly into the superior vena cava; when the latter is badly congested in right heart failure the vena azygos is quickly blocked. The left pleural cavity largely drains via the vena azygos minor, which usually empties into the left innominate vein and so is not so immediately obstructed as is the vena azygos major. There may be also, however, another factor involved in the pulmonary circulation per se, consisting of a freer return of blood into the left auricle from the left lung than from the right. More study of this interesting problem is needed.

DESENSITIZATION AGAINST ERYSIPELAS

To the Editor:—A man aged 45 has had frequent attacks of erysipelas, which always start on the outside of the left leg. Between the attacks there are no visible cutaneous lesions which could serve as entrance for the infection. The condition reacts promptly to sulfanilamide therapy. Is there any possibility that the patient could be desensitized? Have you any other suggestion for preventive treatment? M.D., New York.

ANSWER.—It is possible to produce a higher protective immunity to erysipelas by subcutaneous injections of erysipelas toxin. Most important is treatment of epidermophytosis or any nidus of infection which may provide a focus for the intermittent spread of erysipelas.

USE OF PRESSURE COOKER FOR STERILIZING

To the Editor:—In connection with the last paragraph of the answer (The Journal, Feb. 28, 1942, p. 770) which states "Since pressure cookers are not equipped for drawing a vacuum at the conclusion of sterilization, bandages and wrappings will be slightly moist when the cooker is opened and should be immediately dried by a moderate heating in an oven," I suggest that a sufficiently low moisture content is produced in bandages and wrappings for immediate use if the operator removes the vent weight on conclusion of the sterilization period. It must be remembered that when the temperature drop leads the pressure drop the result is condensation and moisture; however, when the pressure drop leads the temperature drop the result is evaporation. The rapid dropping of pressure will cause most of the moisture trapped in the bandages and wrappings to boil off vigorously. Alfred Vischer Jr., 412 Orleans Street, Chicago. Vischer Products Company.

To the Editor:—Your correspondent states (The Journal Feb. 28, 1942, p. 770): "Since pressure cookers are not equipped for drawing a vacuum at the conclusion of sterilization, bandages and wrappings will be slightly moist when the cooker is opened and should be immediately dried by moderate heating in an oven." It is, however, easy to create a vacuum in them at the end of autoclaving and to obtain dry sterilized goods. After the desired time of pressure sterilization has elapsed, one turns off the heater, opens the steam valve and lets the steam blow off until the pressure has fallen to zero. Then one closes the valve, removes the cooker from the heater and places it in a pan or sink filled with cold tap water. This will bring condensation on the bottom and will create a vacuum. After a few minutes cooling, the valve is opened and air is permitted to enter the cooker until the air flow stops. Then the cooker is opened and the sterilized goods will be found dry. It is not advisable to cool the lid of the cooker also, as this would lead to water precipitation on its inside and the droplets might fall and wet the goods.

Heinrich Lamm, M.D., La Feria, Texas.